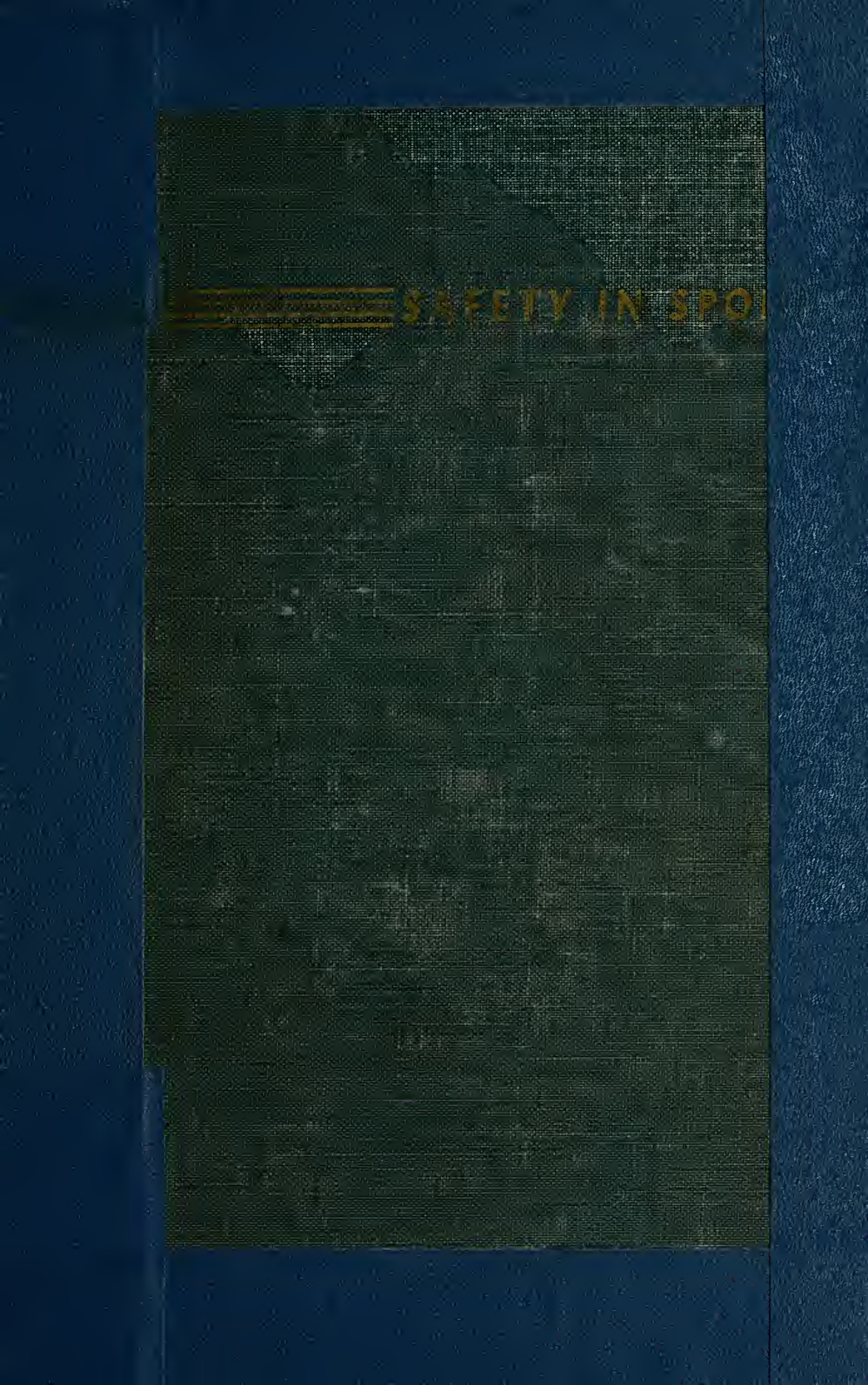
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PRENTICE-HALL BOOKS ON HEALTH AND SPORTS

Edited by Elmer D. Mitchell

SAFETY IN SPORTS

Scholastic Coach

SAFETY IN SPORTS

by

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with an Introduction by

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Director, Center for Safety Education
New York University

New York

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70 FIFTH AVENUE, NEW YORK

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First Printing .....October, 1948
Second Printing .....April, 1949
Third Printing .....January, 1951

PRINTED IN THE UNITED STATES OF AMERICA

To

HERBERT J. STACK

Acknowledged Leader in
Safety Education

INTRODUCTION

DESPITE THE notable advances that have been made in the field of accident prevention, the toll in fatalities, injuries, and cost still remains high. There are some who feel that accidents are unavoidable, and that nothing can be done about it. In athletics and recreation, for instance, accidents are largely accepted as the inevitable risk of participation. Undoubtedly the possibility of injury in sports will always exist, since the human factor is involved, but there is abundant evidence that accidents are preventable. It is contended by those who have made exhaustive studies that accidents in sports can be reduced 50 per cent or more. Since athletics are an accepted part of the school and college curriculum, every effort should be made to meet this challenge.

There have been at least two critical periods in the history of football when the public demanded the abolition of the sport because of its brutality and the high mortality and injury rate. With the possible exception of boxing, no other sport has resulted in so many serious accidents. In fact the fear of football injuries causes many parents to forbid their sons to participate. Schools and colleges have it within their power to dispel this fear by the inauguration of a sound safety program.

The success of a team or program rests to a great extent upon the vital factor of injury prevention. The average coach or physical educator is solicitous of his team. But there are coaches who seemingly are unaware that a lack of knowledge or a false sense of "toughness" can contribute to accidents. It behooves every leader in any phase of physical activity to watch the accident incidence and apply effective preventive measures:

by determining the basic causes, by removing the hazards, and by providing the training and supervision necessary for the development of safe practices.

In the preparation of this volume, Dr. Seaton has carefully analyzed the skills and controls recommended by hundreds of leading coaches in the country. Not only has he determined the underlying causes of the various accidents—the unsafe act, the faulty skill, the equipment hazard—but he has indicated the corrective principle in each case.

There has been a need for a scientific approach to the problem of safety in sports paralleling the work done in the successful accident-prevention programs of American industry. This work of Seaton's will be of invaluable assistance to coaches, physical educators, and to all who are interested in this phase of safety.

Herbert J. Stack, Ph.D.
Director, Center for Safety Education
New York University

FOREWORD

THERE HAS been a definite need for a comprehensive publication incorporating the safe methods of sports participation and of conducting the physical education and interschool athletic programs. This area is responsible for more accidents and injuries than any other in the school program, and it is an area in which approximately one half of the injuries are unnecessary.

There have been quite a few safety studies of the various sports and local play facilities, and at least two on a national scale. There have also been numerous magazine and newspaper articles by experts recommending safety precautions for many sports. The author has endeavored to compile, analyze, and summarize these various studies, publications, and opinions of experts and present them in a concise and usable form. He has consulted many outstanding coaches and physical educators who have advocated or endorsed the safety controls and administrative procedures recommended.

It is hoped that this material will be instrumental in making those engaged in the field of sports aware of the safety problem and familiar with the accepted best practices in its solution, and thus accomplish the purpose of this study—the reduction of unnecessary injuries.

The study which culminated in this book was made possible by the Center for Safety Education, New York University, which granted the author the Sanford B. Perkins Memorial Fellowship for its undertaking. Inspiring and continuous guidance was given by *Dr. Herbert J. Stack,* Director of the Center, to whom this book is dedicated. The author was particularly fortunate in having the sponsorship of a splendid committee at

the University, of which *Professor Ernest R. Wood* was chairman, and *Dr. Leonard A. Larson* and *Dr. R. Emerson Langfitt,* helpful members. *Professor Jay B. Nash,* Chairman of the Department of Physical Education and Health, School of Education, and his staff members, particularly *Bernard Hughes, L. E. Howard,* and *J. D. Mandel,* were most cooperative. Associates at the Center for Safety Education were most helpful: *Milton D. Kramer,* Assistant Director, encouraged the undertaking of the project and provided guidance, particularly in the important early stages; *Dr. Walter A. Cutter,* Administrative Assistant, and *William Hollis,* Fellow, were kind in reviewing various sections of the manuscript.

It is not possible to mention all who contributed to this study and publication. The following should receive special mention because of the exceptional value of their assistance: *Miriam Anderson,* Director of Physical Education for Women, Northern Illinois State Teachers College; *Mathew Barberi,* Department of Physical Education, New Haven Public Schools; *Alfred E. Bergmann,* Teacher of Physical Education, Nicholas Senn High School, Chicago; *George T. Bresnahan,* Assistant Professor of Physical Education and Track Coach, University of Iowa; *Edward Dow,* Football Coach, Nicholas Senn High School, Chicago; *Ray Elliot,* Football Coach, University of Illinois; *Jesse Garrison,* State Supervisor of Health and Physical Education, Alabama State Department of Public Instruction; *Ray Hanson,* Head of Health and Physical Education, Western Illinois State Teachers College; *A. Wendell Hogue,* Principal, Croton-On-Hudson, New York; *Harold K. Jack,* Supervisor of Health and Physical Education, Virginia State Department of Public Instruction; *C. O. Jackson,* Professor of Physical Education, University of Illinois; *Tom Jones,* Track Coach, University of Wisconsin; *Frederick W. Luehring,* Professor of Physical Education, University of Pennsylvania; *Newton C. Loken,* Gymnastic Coach, University of Michigan; *Simon A. McNeely,* Supervisor of Health, Physical and Safety Education, State of Louisiana; *T. Nelson Metcalf,* Professor and Chairman of Physical Education and Director of Athletics, University of Chicago;

Ben W. Miller, Executive Secretary, American Association for Health, Physical Education and Recreation; *Douglas R. Mills,* Director of Athletics and Varsity Basketball Coach, University of Illinois; *N. P. Nielson,* Head of Department of Physical Education and Recreation, University of Utah; *E. H. Nelson,* Chief of Health and Physical Education, Pennsylvania State Department of Public Instruction; *P. F. Neverman,* Secretary, Wisconsin Athlete Benefit Plan; *W. W. Patty,* Dean of School of Health, Physical Education, and Recreation, Indiana University; *Margaret Powell,* Director of Health and Physical Education, Sam Houston State Teachers College; *Gladys Gogle Pratt,* Instructor of Health and Physical Education, Montclair State Teachers College; *A. F. Shaffner,* Nicholas Senn High School, Chicago; *Amos Alonzo Stagg,* Dean of American Football Coaches; *Paul Waskke,* Professor of Physical Education, Oregon State College; *Albert Willis,* Executive Secretary, Illinois State High School Athletic Association; *K. L. Wilson,* Commissioner of Athletics, Western Intercollegiate Athletic Association.

The opinions of many coaches and physical education instructors with varied experience was made available through the use of a questionnaire which was sent all over the country to various men and women in the field of physical education. Many of their recommendations and opinions are quoted throughout the book. The following outstanding coaches and physical educators reviewed the various sports and administrative areas in their particular fields of specialization. The author is extremely grateful to them for giving the study their stamp of approval.

Football. *Dr. Marvin A. "Mal" Stevens.* Team Physician, New York Yankees; Formerly Football Coach, N.Y.U. and Yale University. *William J. Bingham.* Director of Athletics, Harvard University; Chairman, Football Rules Committee, National Collegiate Athletic Association. *Floyd R. Eastwood.* Chairman, Committee on Injuries and Fatalities, National Collegiate Athletic Association; Professor of Industrial Recreation, Purdue University.

Field Hockey. *Natalie Smith.* Wellesley College; Advisory Member, Hockey Committee National Section on Women's Athletics,

American Association for Health, Physical Education and Recreation.

Soccer. *Tom Desmond.* Graduate Student, New York University.

Hunting. *H. L. Ninemires.* Director, Greeley Colorado Activities, Colorado.

Apparatus and Tumbling. *Hartley Price.* Varsity Gymnastic Coach, University of Illinois and Director of Intramural Athletics. *Eugene Wettstone.* Varsity Gymnastic Coach, Pennsylvania State College.

Basketball. *Adolph Rupp.* Varsity Basketball Coach, University of Kentucky.

Boxing. *John J. Walsh.* Boxing Coach, University of Wisconsin.

Dancing. *Ruth H. Bloomer.* Assistant Professor of Physical Education, Connecticut College.

Fencing. *Herbert W. Craig.* Former Fencing Coach at the University of Illinois.

Games, Relays, Calisthenics. *Seward C. Staley.* Director, School of Physical Education, University of Illinois.

Swimming (pool). *H. Norman Engelsen.* Director, First Aid, Water Safety and Accident Prevention, American Red Cross, New York City.

Wrestling. *Nathan Doscher.* Wrestling Coach, Brooklyn College.

Skiing. *Charles "Minnie" Dole.* Founder and Director, National Ski Patrols.

Archery. *Mrs. Myrtle K. Miller.* Director, Teela-Wooket Archery Camp. *Harlan G. Metcalf.* National Recreation Association.

Baseball and Softball. *Louis C. "Pete" Butler.* Varsity Baseball Coach and Chairman of the Department of Health and Physical Education, Colorado State College of Education. *Charlotte La Tourette.* Department of Physical Education, Ohio University.

Crew. *R. H. Sanford.* Crew Coach, Cornell University.

Horseback Riding. *Mrs. Caroline E. Drew.* Riding Instructor, Christian College.

Lacrosse. *G. N. Thiel.* Lacrosse Coach, Pennsylvania State College.

Track and Field. *Homer Allen.* Track Coach, Purdue University.

Badminton, Handball, and Volleyball. *William T. and Ruth Strong Mackie.* Du Sable High School, Chicago, Illinois.

Camping. *Captain Fred C. Mills.* National Director, Scouting Services, Boy Scouts of America. *Barbara Ellen Joy.* Director,

Joy Camps, Wisconsin, Former President of American Camping Association, Inc.

ADMINISTRATION. *Charles Forsythe.* Director of Interscholastic Athletics, State of Michigan. *Howard Danford.* Director of Health, and Physical Education, Florida State University.

OFFICIATING. *Fred H. Young.* Western Conference and Missouri Valley Conference Official. *H. V. Porter.* Executive Secretary, National Federation of State High School Athletic Associations.

SAFETY CHECKLIST AND INVENTORY. *A. G. Haussler.* Principal, West High School, Aurora, Illinois.

NEW CONSTRUCTION. *Walter D. Cocking.* Chairman, Board of Editors, The American School Publishing Corp. *Karl Bookwalter.* Associate Professor of Physical Education, Indiana University.

The statistical information comes mostly from *Safety in Athletics* by Frank Lloyd, George S. Deaver, and Floyd D. Eastwood. Philadelphia: W. B. Saunders Company, 1937. This book, unfortunately, is now out of print, but the authors have done an excellent job on a study of how, where, and why accidents occur. The author has quoted extensively from this work so as to make the information in it available to those who otherwise could not find it.

The author wishes also to express his appreciation to the members of the secretarial staff at the Center for Safety Education, New York University, especially *Elsie Scott,* who typed and retyped the pages of this manuscript. Finally, he is grateful to his wife, *Louise Shoop Seaton,* whose foresight and inspiration helped launch and complete this project.

D. C. S.

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I

SPORTS AND SAFETY

ALL SPORTS have an element of danger. Some, such as tennis, have a very low accident incidence, whereas others, such as football, are highly hazardous. It is this very element of danger and adventure that makes them alluring as well as profitable, and so it is only natural that red-blooded men through the ages have risked life and limb to participate in sports because the spirit of do or die, and take a chance, has been young men's natural heritage. Wherever it has been possible to study the life of early man, some indications of their "sport-mindedness" have been found. Although the form of sports has been varied among peoples and changed with generations, the inherent urge to play and compete has not lessened. When the preparation for war has been the dominant urge of the state, many of the sports used for this purpose have been extremely brutal. But probably the desire to thrill the multitudes has produced the most gory spectacles.

Brutality in Sports

We are all familiar with the brutality of the so-called sports of the decadent Roman days. As many as 350,000 people gathered almost daily at the Circus Maximus to witness the gladiators battle one another with leather gloves studded with metal knobs or spikes. The knockout was not only frequent but, as often as not, permanent! Nor were the Romans satisfied with man killing man in this manner and in naval battles staged between galleys of slaves and war criminals, they also pitted man against beast. At the dedication of the Colosseum, 5,000 beasts of all kinds—lions, elephants, crocodiles, and snakes

—were killed in bloody battle matched against Gaetulion hunters. The Caesars figured heavily in the development of the Roman "sports." One of Augustus Caesar's first acts in 28 B.C. was to revise the harpaston (football) rules then in effect—to make the game less tame! Julius Caesar enjoys the doubtful honor of inventing the bull fight.

The Spartan training of early Greece, designed as a preparation for war, was extremely rugged and ruthless. These Spartan youths underwent the most vigorous and courage-testing sports to prepare themselves for combat. The familiar story of the youth whose insides were gnawed out by a stolen fox that he concealed beneath his jacket to avoid disclosing his pilferage illustrates the results of their "spartan" training through sports participation. The Inca Indians of South America are reported to have played a type of basketball in which the losers of the championship game were put to death. Our own American Indians played a rather brutal sport called lacrosse. Their technique called for the crippling of as many of the opponents as possible by "accidental" smashes with the crosse and then, when the able-bodied opposition had been sufficiently handicapped, playing the game as it should be played.

The development of football is another example of the brutality of early sports. About 1439 Edward III decided it was necessary to prohibit the playing of football in England so that archery, a sport more useful in warfare, could be practiced. Apparently, however, this edict was not effective because Henry VIII and Elizabeth later found it necessary to issue edicts against the same "scourge." The game continued in spite of royal command, and Sir Thomas Elyot wrote, "Football wherein is but beastly furie and extreme violence, thereof proceedeth hurte; and consequently malice rancor do remain with them that be wounded; whereof it is to be put in perpetual silence." [1]

American Football Rough. Although the game of football was entirely different as played in this country, we find the

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[1] Jessie F. Williams and William L. Hughes, *Athletics in Education.* Philadelphia: W. B. Saunders Company, p. 21, quoting T. Elyot, *The Governors Book.* London: Regan Paul French Co., 1883, Chap. XXVII.

Harvard faculty prohibiting further intercollegiate contests in 1885 because of the extreme roughness of the game, claiming that slugging was prevalent because a player was not removed from the game until he had committed his third violation! The following year other colleges agreed to remove a player from the game for one offense of slugging, and Harvard returned to competition. Hill reports that Frederick Remington, a great American artist, when he was a player at Yale in 1879, dipped his jersey in slaughterhouse blood the night before the annual Harvard game, which was probably in keeping with the character of the game of that day.[2]

Football Reforms. The number of deaths from football in 1906 was so great that the repercussions reached to the highest executive of our government, and President Theodore Roosevelt called upon coaches and directors of athletics to solve the problem or abandon the sport. These leaders responded with drastic modifications of the rules of the game, including the introduction of the forward pass. This is probably the first official and national recognition of the importance of safety in sports in this country. Another demand for safety rules arose following the Carnegie Foundation Study of American Athletics in 1929, and again in the fall of 1931, when 48 deaths due to football were recorded. This time the American Football Coaches Association approached the problem in a more enlightened manner. The rules again were modified to control piling up, crawling, and the flying wedge on the kickoff as well as a revision of the "dead ball" rule. A most significant step was taken with the establishment of research machinery to determine the accident facts, including causes, types, incidence, frequency, severity, and parts injured.

During the next few years Frank S. Lloyd and Floyd R. Eastwood made thorough studies of the college and high-school athletic and physical education accident problem and published the results with recommendations. These studies had a profound effect on the field of safety and physical education, and

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[2] Dean Hill, *Football Thru the Years.* New York: Gridiron Publishing Co., 1940, p. 32.

many colleges have added safety units to their courses or instituted special courses for teachers of health and physical education. Thus, football, one of our most popular and highly-publicized sports, brought to light the accident problem in *all* fields of athletic endeavor

Sports Expansion

After World War I sports experienced a tremendous growth in the number of participants and spectators. It was during this period that the majority of the large and expensive stadiums of the country were built. Americans spent approximately four billion dollars annually for sports, 260 million of which was contributed by spectators. Many educators saw history repeating itself in this expansion and feared that it was a presage of the exhibitionism and brutality that prevailed in sports at the time of the fall of the Grecian and Roman empires. In speaking of this condition, Paul Neverman said:

> Through it all, little thought was given to the welfare of the actors in the show. We neglected our responsibility to the individual participant and emphasized attendance, 'names' and feature attractions. Much was made of special devices which permitted an injured player to perform. In football, equipment was designed not alone to protect the wearer, but actually to aid him in making progress through the opposing line. Few of us realized the tremendous percentage of injury in some of our so-called recreational and body-building activities.[3]

The Present. World War II called a "time out" period for the spectators but was responsible for increased participation since hundreds of thousands of servicemen and women learned to play a large variety of sports during their training. Many of these war-training activities were extremely rugged and often hazardous, because the men were being conditioned for combat. This experience has undoubtedly influenced the attitude of these returned veterans toward sports competition; they want a fast and furious brand of entertainment. The present popularity of sports far exceeds anything previously experienced

[3] "Sports for the Student," *Safety Education,* December, 1944, p. 127.

More and more people want to see their favorite teams and heroes in action, and there appears to be no limit to this craving.

The Future. Although many deplore the tendency of our country to indulge in "spectatoritis" and to overemphasize athletics, few predict a return to the brutality of earlier ages. Most evidence points in the opposite direction. Accident records indicate that, in spite of the increasing number of participants, the incidence rate for most sports is taking a downward trend. This improvement has been due to an increased consciousness of the safety problem, and more enlightened leadership; improved facilities and equipment; and the strengthening of the authority of the many governing organizations, of the playing rules, and of their enforcement by well-trained officials.

The General Safety Movement

Man has always been concerned with his own safety, but with the coming of the industrial age, particularly during the twentieth century, this concern has lagged far behind the technological advance. The widespread use of machines for mass production under high pressure caused more and more deaths and injuries, and accidents were accepted as a necessary part of production.

It was not until the early 1900's that certain enlightened industrial leaders became aware of the necessity for an organized safety movement. Judge Elbert H. Gary of United States Steel was one of these early pioneers. It was at this time that the demand for the protection of workmen gave rise to the Workmen's Compensation Laws, of which the oldest in effect (1911) was enacted in the state of New Jersey as a part of Woodrow Wilson's reform movement. Safety in industry soon justified itself. Deaths due to work accidents throughout the nation decreased from 35,000 in 1912 to 18,000 in 1937, despite tremendous increases in the numbers of persons employed.

Public Safety. Public transportation underwent a similar transition at a still earlier date. Railroad and steamship companies succeeded in reducing their accident rate 40 to 60 per

Press Association, Inc.

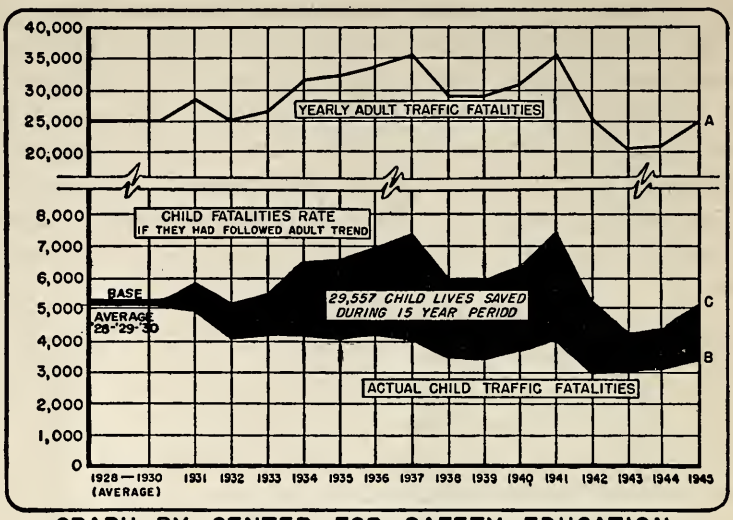
FIG. 1. IN THE EARLY DAYS FOOTBALL WAS PLAYED "FOR KEEPS"

During the days of the flying wedge football was really a "killer." Play has come a long way through the adoption of sensible rules and better equipment.

cent. Today it is estimated that one could travel 1,600 years on an American railroad before being killed. This phenomenal improvement was effected through the education of the general public as well as of employees. Leaders of the most recent mode of transportation, aviation, have attacked the problem of safety in a most enlightened manner and seem well on the road to overcome the intrinsic hazards of flying. Training and controlled licensing, as well as education, play the major role.

The automobile, however, has presented a more complex problem, and today it heads the list of public destroyers of human life by accident. In 1896 there were only four automobiles in the United States, and in 1900 the number had reached only 4,192. Today there are over 30 million in operation, with sufficient seating capacity to move the entire population of this country at one time (one car per 4.9 persons). Since the first automobile accident in 1904 in Kansas City, when the only two cars of that city managed to meet in a head-on collision, the yearly toll has steadily increased until in the peak year of 1941, 39,969 persons were killed and approximately 1,400,000 injured.

Government was slow to recognize its responsibility in the control of the vehicle problem, and because of this and the accompanying social lag, found it difficult to assume its obligations. State licensing of cars for revenue came early, but car inspection and the training and licensing of drivers, two of the basic safety controls, have been slow in being adopted. Automotive engineers have perfected the automobile far beyond our ability to control it safely. Highway engineers have improved the highways and traffic-control devices to the limit of financial resources; traffic police have been provided to the extent permitted by public opinion; but still the accident toll mounts. What is the answer? It is now generally believed that all of these controls can and should be improved, but, above all, that the solution lies in education. Only through acquirement of knowledge and the development of proper attitudes among people in all walks of life can conditions be improved.



GRAPH BY CENTER FOR SAFETY EDUCATION

DATA FROM U.S. BUREAU OF CENSUS AND NATIONAL SAFETY COUNCIL

EXPLANATIONS

In the preperation of this graph the average fatalities for the years 1928-29-30 were used as a base rather than the total for any one year. The fatality curves for adults and children (A and B respectively) were constructed covering the 15-year period. Curve (C) was constructed by assuming that child fatalities might have followed the same trend as adult. Actually, they did not, but followed the curve (B). The difference between these two curves can be considered as a "saving."

It should be pointed out that the achievements in child safety should not be ascribed to safety education alone. There are several other factors or variables that have contributed to the trends. For example, the number of licensed drivers increased markedly beween 1930 and 1941, as did the average mileage. This would tend to increase the hazard or exposure of the adult population to a greater extent than that of children.

IT IS CLEAR, HOWEVER, THAT CHILDREN ARE LEARNING SAFETY BETTER THAN THEIR ELDERS. IN THE FACE OF AN UPWARD TREND IN ADULT TRAFFIC DEATHS SINCE 1930, THERE HAS BEEN JUST AS STEADY A DOWNWARD TREND FOR CHILDREN. IT COULD BE SAID, THEREFORE, THAT 29,000 CHILDREN ARE NOW LIVING WHO MIGHT HAVE BEEN DEAD HAD THE TREND OF CHILD ACCIDENTS FOLLOWED THE SAME AS FOR ADULTS.

Center for Safety Education, New York University

FIG. 2. THE MOST DANGEROUS ACCIDENTS

Comparative review of traffic deaths among adults and children during the 15-year period, 1930–1945.

The National Conservation Bureau, representing a large number of casualty and surety underwriters and originally called the National Bureau of Casualty and Surety Underwriters, was founded in 1922 to promote safety education in all fields of endeavor. The American Museum of Safety was founded in 1911 by the American Institute of Natural History for the same purpose. Among other private agencies interested in safety promotion are The American Legion, Boy Scouts of America, Girl Scouts Inc., Cycle Trades of America, National Board of Fire Underwriters, and the various insurance companies. The American Red Cross has concerned itself with accident prevention as well as with disaster relief, being especially active in water safety and home safety. The American Automobile Association has pioneered and been a leader in traffic safety education and deserves a great deal of credit for the rapidly increasing number of school programs.

A safety committee of the Association of Iron and Steel Engineers, headed by Lew R. Palmer, called the first Cooperative Safety Congress in Milwaukee in 1912, and action taken at this meeting led to the organization of the National Safety Council, the first permanent body with a program devoted entirely to accident prevention.[4]

The Council, located in Chicago, now serves more than 5,000 member organizations through its three main Divisions—Industrial, Public Safety, and Education—and provides the general public with many useful services and publications either free or at nominal cost.

Home Safety. In some years the home has outdistanced the perennial leader in accidents, traffic. There has been an underemphasis on accident prevention in the home and farm areas probably because a man's home is considered his castle, and he resents intrusion, and no powerful pressure groups have been particularly interested in improving the home situation. The National Safety Council, the American Red Cross, and

[4] Herbert J. Stack and Elmer B. Siebrecht, *Education for Safe Living.* New York: Prentice-Hall, Inc., 1942, p. 5.

various farm organizations are meeting with greater success each year in their education programs in these areas, but progress has been slow.

Schools Join the Safety Movement

Although possibly every school official and teacher has integrated some aspect of safety in the school curriculum, it was not until recent years that many administrators recognized general safety education as a function of the school. The viewpoint of educators was aptly expressed when it was said:

> In past years educators may have exhibited some reluctance about safety education. They know the proneness of mankind to feel that a problem has been solved when it has been referred, and how ready society has been to 'solve' some of its great continuing problems by referring them to the schools and then complain about the results.[5]

One of the earliest indications that administrators were beginning to acknowledge this responsibility came in 1926, in the *Twenty-Fifth Yearbook* of the National Society for the Study of Education. This was followed by the influential and well-known Children's Charter of the White House Conference of 1930, which proclaimed:

> For every child, education for safety and protection against accidents to which modern conditions subject him—those to which he is directly exposed and those which, through loss or maiming of his parents, affect him indirectly.[6]

Then in 1940 the American Association of School Administrators placed the final seal of approval upon safety education as a recognized school responsibility by devoting its *Eighteenth Yearbook* to Safety Education.

School Safety Patrols. Before these milestones in safety education came the well-known school safety patrols. As early

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[5] American Association of School Administrators, *Safety Education*, Eighteenth Yearbook. Washington, The Association, 1940, p. 140.

[6] "The Children's Charter," *White House Conference*. New York: D. Appleton-Century Company, Inc., 1930, p. 44.

as 1913 the American Museum of Safety advocated schoolboy patrols to protect pupil pedestrians at school crossings, and such patrols were in operation in Tacoma, Washington, Newark, New Jersey, Chicago, and Brooklyn during that same year. They have become one of the major safety education factors with approximately 300,000 patrols operating in this country. Junior safety councils, first organized in Rochester, New York, in 1918, have become increasingly important student organizations, with 1,200 in existence in 1931.

These patrols inaugurated a downward trend in accidents among elementary school children (a trend accelerated by safety education) that has continued to date. This is the only age group that has not shown a steady yearly increase. (See Fig. 2.)

The Detroit Program. In 1919 Miss Harriet E. Beard, supervising instructor of safety education, organized one of the earliest all-around programs in the Detroit public schools.

> At the end of the first six years of safety instruction, the Detroit schools could point to successful achievement not only in its educational value, but also in civic training and in the altruistic influence upon children in their impressionable years. But more important, between 1918 and 1924, despite an enormous increase in school population and in the number of automobiles on the streets, traffic deaths of Detroit school-age children had dropped from 96 to 45.[7]

Driver Education. The two preceding organizations functioned primarily in the elementary school. The secondary level presented a more formidable problem. Although each subject of the high-school curriculum assumed responsibility for safety education in its particular field, driver and pedestrian education did not fall naturally into any one subject field. For this reason and because of the mounting problem, special courses for the teaching of driver education have been established in many secondary schools throughout the nation, especially during the last fifteen years. Actual behind-the-wheel training in a dual-control car was introduced by Amos E. Neynart, of Pennsylvania State College, and had a rapid growth in popu-

[7] Stack and Siebrecht, *Education for Safe Living*, p. 7.

larity under the sponsorship of the American Automobile Association. At Lane Tech High School in Chicago, a group system for skill practice on dummy cars was developed which other cities are beginning to use. The home-school cooperation plan of behind-the-wheel learning has also found favor among those schools unable to supply practice cars. It is now generally thought that all schools should teach driver education, and that driver training behind the wheel should be made available to all youths before they secure driver's licenses.

Teacher Preparation and Research

With the growth of safety education in the schools of the nation, came a demand for prepared teachers. Teachers College at Columbia University and Peabody College in Nashville, Tennessee were probably the first to offer such courses, which they did during the summer of 1928. The first teachers college in the United States to offer a minor in safety education was State Teachers College of Pittsburg, Kansas, in 1940. In 1939 it was found that 129 teacher-preparing institutions offered 350 courses in safety education. During World War II, however, a number of these institutions dropped such instruction, and in 1946 the American Association of Teachers Colleges made the statement, "Teacher education is one of the weakest links in our safety-education program."

Three universities have become especially identified with instruction and research in safety. Northwestern specializes in enforcement, Yale in engineering, and New York University has become the center for safety education. Dr. A. R. Lauer has also done considerable research in traffic problems at Iowa State College.

Athletic Protection Plans

Despite the fact that more than 40 per cent of the school's injuries occur in the physical education and interschool athletic programs, relatively few attempts have been made to study and alleviate the conditions. One important and practical method of determining accident facts and methods of preventing in-

juries in athletics developed on a national scale during the 1930's. The state of Wisconsin started this movement when, in September, 1930, it initiated its Athletic Accident Plan, the first of its kind in the country. The Plan had a twofold objective: to assist those injured in athletics in paying for the care incident to such injury, and to use the information developed as a fact-finding study for determining causes of injury and methods of prevention. This plan of accident coverage was followed by many other states, until today there are approximately thirty-one offering such protection. That this type of "insurance" has been beneficial in reducing injuries is shown "beyond the question of doubt" in the Wisconsin situation. P. F. Neverman states that the injury ratio dropped from 92 per 1,000 between 1930 and 1934 to 40.5 per 1,000 between 1934 and 1940. "The national average has also been considerably reduced because of the application of facts found in Wisconsin and other states operating Benefit Plans." [8]

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II

INJURIES IN SPORTS

The number of injuries and fatalities occurring in sports tends to be distorted and highly publicized because the outcome of the games may be affected by and even depend upon them. Scarcely a day passes that the sport pages do not carry stories about injuries to various players. For years, coaches have considered it good strategy to publish "bear stories" concerning the large number of casualties among their squads, designed to make the opponents overconfident of victory. Regardless of this disproportionate publicity, there are a great many injuries in sports, many of them unnecessary. The same can be said about accidents in general, and it would benefit us to examine the total accident problem as a prelude to studying the sports accident record.

National Accident Facts

Nearly 100,000 people are killed in accidents each year in the United States. Over ten million others suffer accidental injuries. More people lost their lives in this country in accidents during World War II than were killed in combat in the Armed Services.[1] According to Army and Navy figures, 261,608 persons in Service were killed, whereas 355,000 lost their lives in accidents on the home front. The accidental death rate in the United States exceeds that of most leading nations of the world. Its rate per 100,000 population in 1935 was 78.2; whereas in France the rate was 49.3; in England and Wales,

[1] The figures are not analogous because of disproportionate numbers, but are presented to show the enormity of the accident toll.

40.7; in Germany, 38.8; in Italy, 33.0; and in Hungary, 25.4.[2] (Later United States rates: 1936, 85.7, 1937, 82.0.) Accidents rank fourth as the cause of death in the United States. Only heart disease, cancer, and cerebral hemorrhage cause more deaths. The accidental death rate among males is about two and a half times the female rate, and the rate for the non-white group under twenty is somewhat higher than for the white group. "There have been two main trends of accidental deaths during the last forty years: upward for motor vehicle fatalities, downward for other types."

A breakdown of the national accident fatality toll indicates that the leading area of accidents is the motor vehicle, with an all-time high in 1941 of 39,969 and an anticipated 50,000 for 1950; home, public, non-vehicle, and occupational accidents follow in order. With few exceptions, motor-vehicle accidents account for more deaths each year than any other accident cause; the rate is 21.7 per 100,000. Falls come second with 21.1, burns with 7.5, drowning next with 5.4, firearms, 1.9, and poisons and poison gases are last with 1.7.[3]

School Age Accident Facts

"Although at school age the death rates for accidents as a whole are lower than at any other age, accident fatalities represent by far the most important cause of death among school children at the present time." In fact, the National Safety Council contends that in the age group five to nine, accidents cause five times as many deaths as pneumonia, the next cause; that there are three times as many deaths from accidents in the ten to fourteen age group as from heart disease, the second ranking cause; and that in the fifteen to nineteen age group, accident deaths are most numerous, tuberculosis being second but accounting for only one half as many.

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[2] Official bureaus of foreign governments and the U. S. Census Bureau, 1936.

[3] Sources for statistical data are: National Safety Council, *Accident Facts*. Chicago: The Council, 1943, 1945, 1946; U. S. Department of Labor, Children's Bureau, *Child Mortality from Accidents*. Washington: The Department, 1945; The President's Highway Safety Conference, *Accident Records*. Washington, 1946.

From the reports of the school systems with a total enrollment of 907,000 students, the National Safety Council has estimated that 51 per cent of the accidents to these students during a nine-month school period occurred within school jurisdiction: on the school grounds, in school buildings, and while going to and from school. In terms of the number of accidents per 100,000 student days, the highest accident rate during 1945 was manifested in the eighth grade, and the lowest was in the kindergarten. October and December appear frequently as the most hazardous months. Of the 51 per cent of student accidents occurring under school jurisdiction during 1945, 24 per cent were in school buildings, 20 per cent on the school grounds, and 7 per cent occurred while students were going to and from school. The distribution of school-ground accidents follows: unorganized activities 45 per cent; football 18 per cent; baseball 11 per cent; other organized games 16 per cent; and apparatus 10 per cent. Over 40 per cent of all school-building accidents occur in the gymnasium, swimming pool, and locker rooms. Accidents occurred in the following school locations: gymnasium 33 per cent; hall and stairs 19 per cent; shops 18 per cent; classrooms 13 per cent; others 17 per cent.

Physical Education Accident Facts

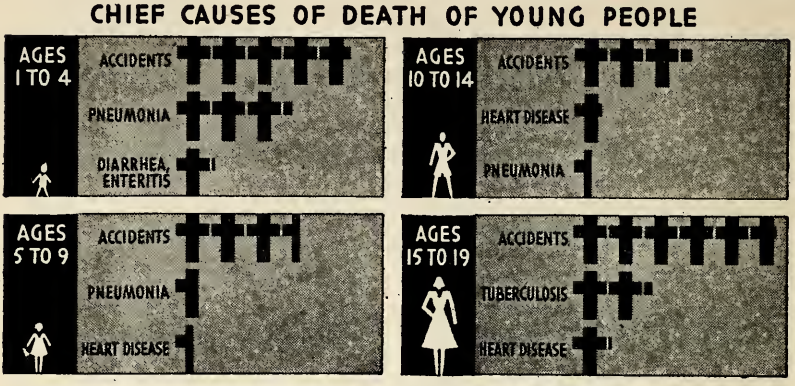
Although it is difficult to compare the relative hazardousness of various activities or areas, the incidence of accidents in athletics tends to be low when compared to others.

It is probable that participation in athletics in general in properly-controlled situations is less hazardous than staying at home, it is certainly less hazardous than walking or playing on the streets, and is probably no more hazardous than going up and downstairs, through swinging doors and similar activities.[4]

Since almost one third (31 per cent) of all accidents on school premises occur in the gymnasium and one fourth (25 per cent) occur in outdoor athletics, it becomes apparent that

[4] Lloyd, Deaver, and Eastwood, *Safety in Athletics.* Philadelphia: W. B. Saunders Company, 1936, p. 24.

the Department of Physical Education is most deeply concerned with the school accident problem. Such comparative figures are not available on the college level, but it is reasonable to assume that the accident incidence would be somewhat similar.



Accident Facts, 1947, p. 90. National Safety Council

FIG. 3. ACCIDENTS LEADING CAUSE OF DEATH AMONG SCHOOL CHILDREN

It is not generally known that accidents claim more lives than any disease among school-age children. This fact calls for more concerted effort to eliminate this "quiet" killer.

As would be expected, the incidence in the various sports varies with the nature of the activity. Those activities involving bodily contact would be expected to be more hazardous than such games as golf and tennis. On the following pages charts giving the relative hazardousness and incidence of the various sports will be found.

Accidents at the College Level

Eastwood,[5] in his comprehensive study of safety in college athletics, found 868 accidents, resulting in 1,367 days lost, among 58 men's colleges with an enrollment of 68,478 students. The 75 women's colleges, with 74,225 students, reported 507 acci-

[5] Floyd R. Eastwood, *Safety in College Athletics.* Ph.D. Thesis, New York University, 1936, p. 84.

dents and 1,723 days lost from physical education classes. He estimated that there were 10,650 accidents in college athletics sustained in a year, resulting in 30,990 days of incapacity, 3,550 of which occurred in women's activities and 7,100 in men's.[6]

TABLE I

Classification of Sports by Degree of Hazard [7]
COLLEGE MEN

Acc. per 1,000 Exp.	*Incidence*	*Classification*	*Incidence*	*Days Lost per 1,000 Exposures*
Football	87.9		512.2	Football
Horse Polo	11.2	Very	74.7	Horse Polo
Wrestling	10.7	Hazardous	24.7	Wrestling
Lacrosse	9.3		10.4	Crew
Soccer	6.1	Highly	7.5	Cross Country
Crew	5.3	Hazardous	7.3	Heavy Apparatus
			5.2	Soccer
			4.7	Touch Football
			4.4	Baseball
Boxing	4.6		3.9	Boxing
Touch Football	3.4		2.9	Lacrosse
Basketball	2.5	Hazardous	2.3	Basketball
Ice Hockey	2.5		2.2	Tumbling
Heavy Apparatus	2.1			
Handball	1.6		1.1	Ice Hockey
Baseball	1.5	Low	1.0	Track Field
Fencing	1.3	Hazard	.9	Handball
Cross Country	1.0		.9	Volleyball
Speedball	1.0			
Misc. Games	1.0			
Track and Field	.7		.7	Misc. Games
Swimming and Diving	.6		.6	Tennis
Calisthenics	.3	Minimum	.3	Calisthenics
Games and Relays	.3	Hazard	.2	Swimming and Diving
Volleyball	.2		.0	Games and Relays
Indoor Baseball	.1		.0	Speedball
Tennis	.1		.0	Indoor Baseball
Tumbling and Stunts	.1		.0	Fencing

The women had a higher severity index (days lost per injury) with an average of 3.4 days lost, as compared to the men with only 1.5. "This difference may be due in part to the tendency among women to avoid re-entering an activity until the injury is completely healed."

[6] Lloyd, Deaver, and Eastwood, *Safety in Athletics* is the source for the statistical data and information in this chapter unless otherwise indicated.

[7] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 26.

Type of Injuries. Eastwood found that, in general, the type of injury sustained by college participants in athletics ranked in order as follows: (1) sprains, (2) strains, (3) wounds, (4) bone injuries, (5) internal injuries. Also the findings showed that college men have more strains and fewer bone injuries than college women. The parts of the body injured most frequently were, in general, the same for all ages, male and female, on the high-school and college level and were, in order: (1) leg and foot, (2) arm and hand, (3) head and neck, (4) shoulder, (5) pelvis, (6) back, (7) thorax and abdomen.

TABLE II

Classification of Sports by Degree of Hazard [8]
COLLEGE WOMEN

Accidents per 1,000 Exposures	*Incidence*	*Classification*	*Incidence*	*Days Lost per 1,000 Exposures*
Heavy Apparatus	11.4		42.7	Heavy Apparatus
Riding	10.1	Very	33.1	Riding
Field Hockey	7.8	Hazardous	25.2	Basketball
			24.7	Soccer
			22.2	Field Hockey
Basketball	6.9		16.2	Tumbling and Stunts
Speedball	5.6	Highly	15.0	Deck Tennis
Games and Relays	5.1	Hazardous	12.0	Track and Field
			8.2	Games and Relays
			7.3	Calisthenics
Lacrosse	3.3		6.3	Archery
Soccer	3.1		5.8	Lacrosse
Track and Field	3.1		4.3	Indoor Baseball
Tumbling and Stunts	2.9	Hazardous	4.1	Golf
Fencing	2.8		3.5	Dancing
Indoor Baseball	2.5			
Crew	2.2			
Deck Tennis	2.1			
Badminton	1.2		2.3	Swimming and Diving
Archery	1.1	Low	2.0	Tennis
Golf	1.0	Hazard	1.4	Speedball
Tennis	1.0		1.4	Crew
Dancing	.88		.6	Volleyball
Swimming and Diving	.80	Minimum	.0	Badminton
Volley Ball	.68	Hazard	.0	Fencing
Calisthenics	.64			

[8] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 27.

Causes of Accidents. Lloyd and Eastwood classified the cause of accidents as follows: those caused by inadequate equipment, those caused by inadequate leadership, and those which were probably unavoidable because of the nature of the game. Among college women, Eastwood found 27 per cent of all accidents were due to inadequate equipment, 29 per cent due to inadequate leadership, and 43 per cent due to the nature of the game. For men 10 per cent were due to inadequate equipment, 16 per cent to inadequate leadership, and 74 per cent to the nature of the game. See Table V for a comparison with high-school causes.

The opinions secured by Eastwood of a large number of teachers of Physical Education, covering the greatest hazards in their own teaching situation, ranked as follows:

College Men	*College Women*
1. Slippery field	1. Slippery field
2. Slippery shower floor	2. Uneven ground
3. Uneven ground	3. Slippery shower floor
4. Slippery swimming pool sides	4. Steps or stairs
5. Overcrowding of floor space	5. Slippery gym floor
6. Slippery gymnasium floor	6. Slippery swimming pool sides
7. Wall obstructions	7. Wall obstructions
8. Carelessness of students	8. Overcrowding on floor
9. Overcrowding equipment	9. Pillars or posts
10. Steps and stairs	10. Poor gym surfacing (splinters, etc.)
	11. Unscreened windows
	12. Equipment inadequately set up

Accidents at the High-School Level

On the basis of a study of 510 private and public secondary schools selected from twenty states representing 68 per cent of the population, Lloyd [9] estimated that approximately 17,330 accidents occur in athletic activities each year, with 70,760 days lost, or an average of approximately four days per injury. This represents a total loss of over 17,000 school days, or approximately 87 school years lost each year as a result of accidents occurring in physical education activities in high schools.

It will be noted in Table V that the very hazardous and highly hazardous sports (more than 5.0 incidence) are, in order:

[9] *Safety in Athletics*, p. 23.

TABLE III

Type of Injury — Gross Percentages [10]

Combined Men and Women				*College*				*High School*			
College		*High School*		*Men*		*Women*		*Men*		*Women*	
INJURIES											
	per cent		*per cent*		*per cent*		*per cent*		*per cent*		*per cent*
Sprains	33	Sprains	34	Sprains	32	Sprains	36	Sprains	32	Sprains	39
Strains	28	Strains	24	Strains	29	Wounds	23	Bone Injuries	26	Strains	33
Wounds	22	Bone Injuries	22	Wounds	22	Strains	22	Strains	22	Wounds	17
Bone Injuries	12	Wounds	17	Bone Injuries	11	Bone Injuries	15	Wounds	17	Bone Injuries	11
Internal Injuries	3	Internal Injuries	2	Internal Injuries	3	Internal Injuries	2	Internal Injuries	2	Internal Injuries	1
SEVERITY INDEX											
Bone Injuries	5.2	Bone Injuries	5.2	Bone Injuries	4.6	Bone Injuries	6.6	Bone Injuries	11.4	Bone Injuries	8.2
Sprains	4.2	Sprains	5.3	Sprains	4.2	Sprains	3.8	Sprains	6.0	Internal Injuries	4.8
Internal Injuries	3.6	Internal Injuries	3.6	Internal Injuries	4.1	Strains	2.9	Strains	3.7	Sprains	3.2
Strains	2.9	Strains	3.0	Strains	2.9	Wounds	.9	Internal Injuries	3.3	Strains	1.7
Wounds	1.5	Wounds	1.9	Wounds	1.8	Internal Injuries	.3	Wounds	.3	Wounds	.6

[10] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 32.

(1) touch football, (2) heavy apparatus, (3) football, (4) lacrosse, (5) wrestling, (6) tumbling.

Types of Injuries. In general it may be said that the types of injury sustained by high-school participants in physical education will be in order of rank: (1) sprains, (2) strains, (3) bone injuries, (4) wounds, (5) internal injuries. Lloyd further found that high-school boys have approximately two and a half times more bone injuries than high-school girls or college men and that these may be expected to be much more severe. Strains may be expected to occur more frequently among high-school girls than boys.

It was stated that the order of the frequency of injuries to the various parts of the body are, in general, the same as for the college level. It is pointed out, however, that back injuries to girls in high school are serious and that thorax and shoulder injuries to high-school boys are very serious. It will be noted in Table IV that:

> The changes in the rank order of severities of the parts of the body injured are of utmost importance. Among high-school students the order runs from highest to lowest: thorax, shoulder, pelvis and thigh, arm and hand, leg and foot, abdomen, head and neck, and back. In high-school girls, it will be noticed, the injuries to the abdomen jump to the top severity, followed by the back, pelvis, leg and foot, arm and hand, shoulder and neck, and thorax.[11]

Causes of Accidents. Lloyd found that 20 per cent of the high-school accidents and 10 per cent of the total days lost were attributable to equipment hazards. Being struck by a piece of playing equipment was the most frequent cause of such accidents (42 per cent), followed in order by: collisions with other objects, such as benches on side lines, 25 per cent; slippery surfaces, particularly gymnasium floors, 14 per cent; tripping over extraneous objects on the playing areas, 5 per cent; uneven playing surfaces, 4 per cent; improper personal equipment, 4 per cent; too restricted a playing area resulting in overcrowding, 1 per cent.

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[11] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 33.

TABLE IV

Part of the Body Injured, All Sports [12]

MEN	COLLEGE	WOMEN	
	Injuries		
	(Per cent)		*(Per cent)*
Leg and Foot	41	Leg and Foot	45
Arm and Hand	15	Arm and Hand	24
Head and Neck	15	Head and Neck	18
Shoulder	9	Shoulder	2
Pelvis and Thigh	8	Pelvis and Thigh	3
Back	4	Back	5
Thorax	3	Thorax	1
Abdomen	1	Abdomen	1
	Severity		
Shoulder	6.8	Shoulder	7.2
Leg and Foot	3.9	Leg and Foot	4.4
Thorax	3.1	Thorax	4.3
Pelvis and Thigh	2.9	Pelvis and Thigh	4.2
Arm and Hand	2.9	Arm and Hand	3.3
Abdomen	2.5	Abdomen	1.5
Back	2.0	Back	1.4
Head and Neck	2.0	Head and Neck	1.7
	HIGH SCHOOL		
	Injuries		
Leg and Foot	37	Leg and Foot	36
Arm and Hand	26	Arm and Hand	35
Head and Neck	20	Head and Neck	21
Shoulder	9	Shoulder	2
Pelvis and Thigh	3	Pelvis and Thigh	1
Back	2	Back	4
Thorax	2	Thorax	1
Abdomen	1	Abdomen	1
	Severity		
Thorax	11.4	Abdomen	5.2
Shoulder	11.2	Pelvis and Thigh	4.3
Pelvis and Thigh	7.7	Back	4.7
Arm and Hand	6.7	Leg and Foot	3.6
Leg and Foot	6.5	Arm and Hand	2.9
Abdomen	5.7	Shoulder	1.8
Head and Neck	2.0	Head and Neck	.7
Back	1.8	Thorax	.3

In the high schools, 51 per cent of all accidents and 30 per cent of the days lost were caused by improper leadership con-

[12] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 32.

trols, such as inadequate officiating, 44 per cent; inadequate supervision, 40 per cent; and inadequate conditioning of students, 13 per cent.

Following is a list of causes enumerated by a large number of high-school instructors when solicited by Lloyd for their opinions:

High Schools

Slippery shower rooms	50
Slippery gymnasium floors	45
Uneven ground	41
Steps and stairs	33
Overcrowding floor space	21
Wall obstruction in playing space	13
Slippery swimming pool sides	13
Pillars or posts in playing space	12
Equipment in poor repair	11
Swinging doors	10
Poor construction which obstructs teacher's vision	6
Drinking fountains	2
Carelessness of students	2
Inadequately erected equipment	1

For the purpose of this study, Lloyd's work was most valuable because it was on a national scale. There have been, however, several studies of local situations, particularly on the high-school level, that might be mentioned. Among these are the football studies by Nielsen, Burnett and O'Brian, and Dunnaway, and the physical education studies by Higbee, Morris, and Forney. Lloyd and Eastwood utilized various information from each of these studies.

Accidents at the Elementary-School Level

Each year the National Safety Council tabulates accidents from reports of a large number of schools throughout the country. Included in this is a brief summary of accidents in physical education. The 1946 compilation of *Accident Facts,* based on reports of 17,490 accidents for the nine months from school systems with an average enrollment of 907,228 pupils, discloses a gradual accident increase in all physical education activities, from the kindergarten to high school. This may be due in part

TABLE V

Classification of Sports by Degree of Hazard [13]
SECONDARY SCHOOLS

Accidents per 1,000 Exposures	*Incidence*	*Classification*	*Incidence*	*Days Lost per 1,000 Exposures*
Touch Football	17.1		88.0	Heavy Apparatus
Heavy Apparatus	13.6	Very	81.5	Touch Football
Football	8.7	Hazardous	72.4	Wrestling
			64.5	Football
Lacrosse	5.9		23.5	Tumbling
Wrestling	5.7	Highly	14.0	Speedball
Tumbling	5.1	Hazardous		
Ice Hockey	3.5		7.6	Field (Track)
Archery	3.5		7.3	Cross Country
Basketball	2.6		6.2	Basketball
Speedball	2.4	Hazardous	5.9	Lacrosse
Field Hockey	2.3		4.9	Soccer
Fencing	2.0		4.8	Ice Hockey
			4.3	Field Hockey
			2.3	Baseball
Baseball	1.0		.9	Track
Field (Track)	.9	Low	.7	Handball
Soccer	.9	Hazard	.7	Swimming
Cross Country	.8		.6	Indoor Baseball
Swimming	.6		.5	Fencing
			.4	Volleyball
Handball	.35		.16	Boxing
Track	.32		.05	Tennis
Golf	.26		.02	Calisthenics
Indoor Baseball	.23		.0	Dancing
Dancing	.19	Minimum	.0	Archery
Boxing	.16	Hazard	.0	Golf
Volleyball	.14			
Tennis	.10			
Calisthenics	.09			

to the lack of an organized program and gymnasium facilities in the lower grades. Bearing out this supposition is the fact that the number of accidents in unorganized activities in the lower grades is particularly high, declining with each higher grade. The figures in Table VI disclose this tendency.

As would be expected, more accidents occur on playground apparatus to children of the lower grades than to those of the

[13] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 28.

higher grades, because of the frequent use of such apparatus as swings, slides, and teeters. Similarly, there is an increasing percentage of accidents due to athletics, including baseball, football, soccer, and track, beginning with a low of .05 per cent in the first grade and rising to a high of 0.3 per cent in the ninth grade.

TABLE VI

A Comparison of Accidents Among Elementary-School Children [14]

	K	1	2	3	4	5	6	7	8	9
School Building, Phys. Ed.	1.3	2.3	2.6	2.9	4.2	4.3	7.5	12.4	13.8	19.7
School Grounds, Phys. Ed.	5.1	5.2	5.0	4.5	6.5	7.6	7.5	6.7	8.9	9.9
Total Phys. Ed.	6.4	7.5	7.6	7.4	10.7	11.9	15.0	19.1	22.7	29.6
Unorganized Activities	8.8	13.2	15.2	13.9	13.0	12.0	12.1	6.7	6.4	4.0

Brown, in a study of all school accidents occurring among more than 700,000 pupils enrolled in 400 New York City elementary and junior high schools during the years 1931–1934, found that 49.7 per cent took place in physical education areas (including 17.3 per cent during recess, which is often not considered a part of the physical education program). These accidents were distributed as indicated in Table VII. He also found the severity index highest in physical education.

Among other important data, Brown found that:

1. There were twice as many accidents among boys as among girls.
2. The noon hour was the most hazardous hour of the school day, one fifth of all school accidents occurring during this hour.
3. Over half of the injuries to school children in all areas of activity involved the face, hand, and lower leg between the knee and ankle, with the skull, foot, and ankle ranking next.
4. In physical education activities which took place during the

[14] Adapted from National Safety Council, *Accident Facts*, 1946, p. 92. Percentages are of the total number of accidents occurring to children at school, in the home, to and from school.

TABLE VII

Physical Education Accidents Among Elementary-School Children [15]

Physical Education	*Per Cent 49.7* *	*Rank*
Recess	17.3	1
Games and Relays	9.8	2
Unorganized Play	5.4	6
Baseball	3.7	9
Basketball	2.8	10
Combatives	1.5	16
Football	.9	23
Track and Field	.8	25
Others	5.8	5

* Percentage of *all* school activity accidents.

period devoted to this subject, approximately half (49.7 per cent) of the accidents took place during recess, and just before and after school sessions.

Brown made a further analysis of the accident severity, stating:

> In those cases where the same type of activity was carried on indoors and outdoors, the accidents were more severe indoors. The average days lost in accidents during recess was 2.6 indoors and 0.6 outdoors; during games and relays it was 1.2 indoors and 0.7 outdoors; in team games it was 1.8 indoors and 0.9 outdoors. Unorganized play was equally severe in both areas (1.1 A.D.L.), and in the few cases when pupils engaged in fights and were injured (combatives), those occurring outdoors averaged 10.3 days lost and indoors 6.0 days lost. Most of the gymnasia in the elementary and junior high schools in this city [New York] were never designed for the purpose; are very small; and contain posts, so that when accidents occur they are more severe than if conditions were more favorable.[16]

Pinckney [17] discovered that for all accident locations, play and recreation was reported once for each mention of any other activity; that is, 49.81 per cent of the pupils were engaging in play and recreation at the time of the injury. It is interesting to note that Brown and Pinckney found almost identical acci-

[15] Hubert E. Brown, *A Study of Safety in the Elementary and Junior High Schools of New York City*. Ph.D. Thesis, New York University, 1938, p. 110.

[16] H. E. Brown, *A Study of Safety*, p. 112.

[17] Jeannie M. Pinckney, *An Accident Study of Texas School Children*. University of Texas, 1936, p. 3.

dent percentages in these entirely different sections of the country.

Other local studies indicate an even higher rate of accidents in physical education activities among grade-school children. Of 465 accidents in the Madison, Wisconsin Public Schools from April, 1941 through February, 1942, 55.5 per cent involved pupils in play activities.

All-Grade Accident Records

The Insurance Section of the Business Division of the Los Angeles Board of Education compiles a list of accidents among approximately 263,799 children in all grades each year. During the 1945–46 school year, there were 10,855 major and minor accidents, approximately 67 per cent of which occurred on and 8 per cent off the school grounds.

Of the school-ground accidents, games were responsible for the greatest number—4,681 or 37 per cent—of the latter, 786 were due to football; 3,293 or 23.6 per cent to miscellaneous, with falls most prominent; and 840 or 6.2 per cent to apparatus, bars being the chief offender and causing 230 accidents. In the above cases the major and minor accidents have been considered together.

Of the 3,248 school-building accidents, the greatest number —675 or 3 per cent—occurred in the gymnasium, whereas 81 or 1 per cent took place in the locker and shower rooms. The low percentage of accidents in the gymnasium and the high percentage on the playgrounds is probably because of the greater availability of outdoor spaces in the California climate. There were five fatalities, one of which was due directly to a fall from a horizontal bar, and another child, with an arm broken on a slide, died under the anesthetic.[18]

The Playground

There has been no comprehensive national study of playground accidents, other than the National Safety Council's an-

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[18] Los Angeles City School District, *Summary of Accidents,* 1945–1946, p. 60.

nual tabulation of school accidents. However, several cities have conducted such surveys, notable among which are the studies of Oakland, Los Angeles, Detroit, Philadelphia, Madison, and New York.

One of the best was the survey conducted by the Los Angeles Playground and Recreation Department (1926–1929), which found that apparatus contributed 63.5 per cent of the injuries; athletics and organized play, 23.6 per cent; and free play, 12.9 per cent. During the first twenty-four months, when no particular safety plan was in operation, the accident incidence was 2.04 per 100,000 participants, which dropped to 1.27 during the last fifteen months with a definite safety program in operation. The data further indicated that "accidents to females were proportionately less frequent than accidents to males, and that 84 per cent of accidents were incurred by active participants, 0.6 by spectators, and 15.4 per cent by persons intruding in other's play." [19] It showed further that the following factors contribute to accidents in the percentage indicated:

TABLE VIII

Factors Contributing to Playground Accidents

Grip lost	32.9
Playing in restricted areas	12.7
Tripping, falling	9.8
Collisions	9.3
Pushing or crowding	8.7
Struck by bat, stick, mallet	6.4
Unauthorized climbing	4.6
Standing instead of sitting	4.0

In Oakland, California during 1931–32 there were 224 injuries, with approximately 19,200 exposures, a ratio of one injury to 657 children or .12 per cent. Of these injuries, 139 were listed as extremely trivial and not sufficiently important to be considered in the final tabulation data. Adding this number to the 224 considered increases the accident incidence to approximately .3 per cent. This report for the elementary-

[19] Playground and Recreation Association of America, *A Study of Playground Accidents in Los Angeles.* New York: The Association, Bulletin No. 2053, March, 1929, p. 24.

school playgrounds summarized all causal factors for accidents in playground situations as follows:

TABLE IX

Causal Factors of Playground Accidents [20]

Purely accidental	129
Inadequate yard supervision	65
Inadequate instruction	30
Inadequate organization	27
On wrong apparatus	18
Dangerous surfacing	15
Previous similar injury	14
Defective equipment	6
Traffic lanes not satisfactory	2

Organized Camping

Sanders made the first comprehensive study of safety in organized camping in 1929–30 when he surveyed 617 summer camps of various types throughout the United States. These camps reported 5,313 accidents among approximately 121,364 campers during the two seasons. It is impossible to compare the relative safety of life in camp with that out of camp, because the standards of reporting have very little in common. It was found, however, that in a camp of seventy-five persons, one accidental injury would be expected weekly and in only one camp in twenty would an injury be so severe that the injured would be forced to leave camp during the season. Sanders summarizes the major camp safety problems as follows:

(1) The problem of maintaining such physical conditions in camps that accidents from that source may be reduced or eliminated. (2) The problem of so preparing campers for the new and hazardous activities of camp life that they may meet them with safety and success. (3) The problem of building a program of safety which is really effective without sacrificing adventure, and the education for which the better camps exist.[21]

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[20] *Report on Accidents and Injuries Occurring in Elementary Playgrounds* for the fall term 1931–32. Accident Committee of Division of Physical Education, Oakland, Calif.

[21] J. Edward Sanders, *Safety and Health in Organized Camps*. New York: National Conservation Bureau. Ph.D. Dissertation, Columbia University, 1931, p. 52.

Types of Injuries. The types of injuries that may be expected in summer camps are found in Table X.

TABLE X

Types of Injuries in Camping [22]

Tissues Involved	*Percentages* Boys	Girls
Skin		
All Skin	68	63
Cuts	41	20
Poison Ivy	8	18
Infections	10	6
Burns—Sunburns	7	5
Bites	2	14
Muscles		
Bruises and Strains	8	7
Ligaments		
All Ligaments	10	20
Sprains	9	19
Dislocation	1	1
Bones		
Fractures	3	3
Others	8	6

From a total of 3,238 injuries to boys and 1,405 to girls, about two thirds of the injuries are minor skin injuries, and muscle bruises, strains, sprains, and bone injuries make up the remaining one third. Boys suffer approximately 40 per cent more injuries than girls. Girls experience twice the ratio of sprains, whereas cuts and lacerations account for double the percentage among boys.

Causes of Injuries. As a parallel to national accident statistics, campers are injured most frequently by falls. Boys are injured more often than girls by stepping on objects and through collisions. It would appear from these facts that the camp paths are the areas of greatest hazard (see Table XI). As would be expected, boys are more likely to be injured in athletics, and girls by falls, stings, and bites. Sanders comments also that ". . . injury statistics tend to cover up swimming accidents and hazards, for even a near drowning would not be re-

[22] Sanders, *Safety and Health in Organized Camps*, p. 52.

TABLE XI

Causes of Camp Accidents [23]

Cause	Percentages Boys	Girls
Falls	16	20
Stepping on Objects	16	8
Collisions	16	9
Slips with Tools	10	6
Bites and Stings	2	14
Athletics	6	4
Natural Defects	1	1
Unclassified	33	38

ported unless the shock attendant to it were sufficiently severe to send the individual to bed." [24] It should be pointed out that a high percentage of the fatigue duty accidents were due to cutting wood.

Activities Engaged in When Injured. Table XII, also by Sanders, lists the activities engaged in when injured. Walking and running around camp paths ranks first in rate per

TABLE XII

Camp Activity Engaged In When Injured [25]

	Percentages Boys	Girls
Unclassified	28	34
Walking and Running Around Camp Paths	20	31
Swimming	14	12
Recreation	11	6
Baseball	9	3
Shop and Craft	7	4
Hiking	6	7
Fatigue Duties	5	3

1,000 for boys and girls. Again, the only noticeable difference is that boys suffered more injuries while engaged in recreation than did girls.

[23] Sanders, *Safety and Health in Organized Camps*, p. 53.
[24] *Ibid.*, p. 56.
[25] *Ibid.*, p. 53.

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III

SAFETY, THROUGH SKILLS

It would seem unnecessary in a generation which has seen an unprecedented destruction of human life and human values to have to justify an ordered way of life. . . . Safety represents the efficiency of adjustment which man makes to his total environment. It is not, cannot be, optional. It has become a condition of survival, and as such, an essential quality of the individual. It involves foresight and interplay of innumerable insights, cautions, and efficiencies which enable the individual to meet life's demands and opportunities on better-than-even terms.[1]

SAFETY, THEN, is a way of life. It involves a principle of living that the home is no longer able to cope with alone. Technological advances have produced hazards so great, and the intellectual and emotional preparation required for living satisfactorily among them is so extensive, that safety has emerged as one of the major problems of our civilization. It is principally to the school and community, then, that we must look for the development of the attitudes, habits, and skills that are necessary if we are to live with reasonable safety in the modern world. In many instances, because of the complications of modern life, individuals are powerless to protect themselves unless they function as a group. Hence we have a large number of protective measures in the form of laws, regulations, and organizations whose functions are to provide guidance and leadership in meeting life's safety problems. Miller says: "The safety movement is based upon the instinct of self-preservation, modified by ideas of mercy and justice and transplanted by the imagination, so

[1] The President's Conference on Highway Safety, *Report of Committee on Education,* Washington, 1946, p. 3.

that self-preservation becomes a right recognized and extended to his neighbor." [2]

The safety movement is a large and not too well coordinated effort.

> In its development and growth, every movement has suffered from misconception and from lack of definition and direction. In this aspect, safety education has been no exception. It has followed rather closely the same general pattern of evolving ideas, events, and movements. Only recently has it begun to emerge from its confused state with a somewhat definite pattern and implication.[3]

Contributing to this confusion has been the usual misconception of the meaning of safety. All too many persons have thought of safety in terms of "safety first." It has been felt generally that to be safe one must accept a static, negative concept of not doing this or that. This concept and the "safety first" slogan originated in industry and railroading where it may apply, but it has no place in the basic philosophy of education. If we were to be guided by such a negative concept of safety in our actions, not only would programs be impeded, but life itself would be a dull affair, lacking in both stimulus and accomplishment. Here we must ask "safety for what?" In other words, the educator believes that safety should be realized for some purpose; that it is positive and substitutional. Some of these purposes may be considered one's physical well-being or even life itself, efficiency, and more and better adventures.

More and Better Adventures

Acting safely, not taking unnecessary risks, enables one to enjoy more and better adventures. The person who dons skis for the first time and attempts a steep downhill schuss is being adventurous but foolhardy. The person who attempts driving in a city without having mastered the fundamentals of automo-

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[2] Ben W. Miller, *A Student Manual of Directed Study Exercises for Safety Education,* Indiana University, October, 1939, p. 3.

[3] Stack and Siebrecht, *Education for Safe Living,* p. 16.

Scholastic Coach

Center for Safety Education
New York University

FIG. 4. LEARN TO DRIVE SKILLFULLY

Skill in driving is an important factor for safety. When driving is learned correctly with expert guidance, both drivers will "get better distance."

bile manipulation is also being adventurous, but is endangering not only his own life but the lives of others. Both may shorten and even terminate their adventures. The Eighteenth Yearbook, *Safety Education,* expressed this philosophy of more and better adventures through safety, expounded earlier by Whitney, when it said: "Since safety is not negative but substitutional, its effect is not to impoverish life but to enrich it through an increase in the quality of the adventure; safety, however, not merely increases the quality of the adventure but, contrary to common belief, increases its amount." [4] Admiral Byrd, one of America's greatest adventurers, had this to say about his exploits in a letter written to the children of America: "I want

[4] American Association of School Administrators, *Safety Education,* Eighteenth Yearbook. Washington: National Education Association, 1940, p. 18.

them all to know that in all my travels and adventures in the interests of science and discovery I have never taken an *unnecessary* risk. By careful planning and by taking no unnecessary chances, my men and I have lived to enjoy the hazards and thrills of adventure and discovery." Thus it can be seen that the safety movement, when intelligently planned and conducted, need not restrict the necessary and desirable activities of man. Rather a safety program should seek to increase the number of adventures and enlarge upon each activity, but at the same time should *teach people to be cognizant of their limitations and more selective in their activities.* This principle is particularly applicable to sports participation because of the very nature of sports and the athlete.

The Nature of Sports

In all ages sports have been associated with the release of pent-up emotions—pugnacious, chivalrous, religious, sexual, or patriotic. Play provides an opportunity for the participant to "lose himself." Interpolating from a famous sports writer, Jimmy Cannon—play is not life, it is an escape from life. The player is usually stimulated to go all out, to give it all he's got. Adolescents especially, who have a strong distaste for restraint, welcome the opportunity to let go. This spirit does not generate or even tolerate cautiousness, timidity, or faintheartedness. Physical education and sports activities, then, by their very nature are hazardous and adventurous. It is this element of risk and adventure that makes the activity most appealing and fruitful. Leaders in the field would not have it otherwise. Lloyd, Deaver, and Eastwood summarize the nature of sports in relation to safety as follows:

> Practically all activities involve hazards, athletics particularly so, since they are situations largely organized around the emotional tendencies of attack and retreat. Also, since athletics involve play with the emotional patterns characterized as fear and rivalry, cooperation and individual aggrandizement, defeat and success, it follows that much is at stake and risks will be incurred to achieve success. Some of the hazards found in athletics then will be due to the nature

of the game; to remove these would be to dehydrate the activities until they become unrecognizable and uninteresting.[5]

There are, however, many needless accidents and injuries in physical education and sports. Lloyd and Eastwood estimated that *approximately 50 per cent of all accidents could be eliminated through proper facilities and leadership.* Contrasting this, Heinrich believes 98 per cent of industrial accidents to be unnecessary and avoidable.

Albert W. Whitney, one of the pioneers in safety education and its accepted philosopher, expressed clearly the modern point of view with regard to the responsibility of recreation leaders when he said:

> . . . teach a boy to play football safely, or to sail a boat safely, or to use a gun safely; in each case you are showing him how he can have a good adventure instead of a bad one. Instead of the bad adventure of breaking his collarbone he can have the good adventure of carrying the ball across the goal line; instead of the bad adventure of tipping his boat over and either ending his adventure entirely by drowning or temporarily by a stupid wait for help, he can have the good adventure of sailing on to a thrilling finish; instead of ending his hunting adventure with a bullet through his leg, he can have the better adventure of the chase. . . .
>
> From this point of view, the relation between safety and recreation is immediately clear. Safety rids us of the bad adventure and opens the way to the good adventure, but it remains for recreation actually to bring the good adventure. We must not put the children off the streets (for playing in the streets is better than not playing at all), unless we can furnish them with other, safer places in which to play. The two movements must go hand in hand. The safety movement needs the recreation movement in order to supply the better adventure. The recreation movement needs the safety movement in order to free life for the better adventure. They are both bound together as inseparable parts of the movement for a richer, better, more spiritual, more truly adventurous life.[6]

Any school or organization promoting a program of physical education or recreation must face these responsibilities.

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[5] *Safety in Athletics,* p. 174.

[6] Albert W. Whitney, *Safety for More and Better Adventures.* New York: National Safety Council Inc., 1923, p. 6.

Any individual, especially one past thirty years of age, undertaking participation in sports, particularly the more hazardous ones, should realize that there is a certain amount of risk involved, but that this risk can be minimized and the pleasure increased through careful preparation.

What Constitutes an Accident?

If a person were walking on a crowded street and lightning "selected" him to kill, we would say it was an Act of God. At the other extreme, a certain number of neurotic people choose to injure or kill themselves. Relatively few people suffer injury from these two causes, but most persons are prone to ascribe *all* accidents to Acts of God. The majority of people are, however, injured by an unplanned event immediately caused by an unsafe act or a mechanical or physical hazard, which is ordinarily spoken of as an accident caused by carelessness. In common terms, accidents are caused; they do not happen. We can safely say that a personal injury accident is always the result of one or a combination of the following: an Act of God, self-planned destruction, and an unplanned event or accident, with the last predominant.

Safety engineers have generally accepted Heinrich's [7] theory that an injury in industry invariably results from a completed sequence of five factors. He illustrates this theory with the five dominoes (Fig. 5), pointing out that when one is "touched over" it pushes over the next, and each one the one following it, until the sequence is completed and injury results—unless one of the factors is removed to stop the sequence.

Accidents in Physical Education. At first observation, the physical educator would be likely to say that this sequence and the categories above do not explain the injuries that occur in athletics. Ordinarily, athletic injuries are not considered to be the result of accidents. For instance, if a football player tackles another and breaks his clavicle, we do not say he was

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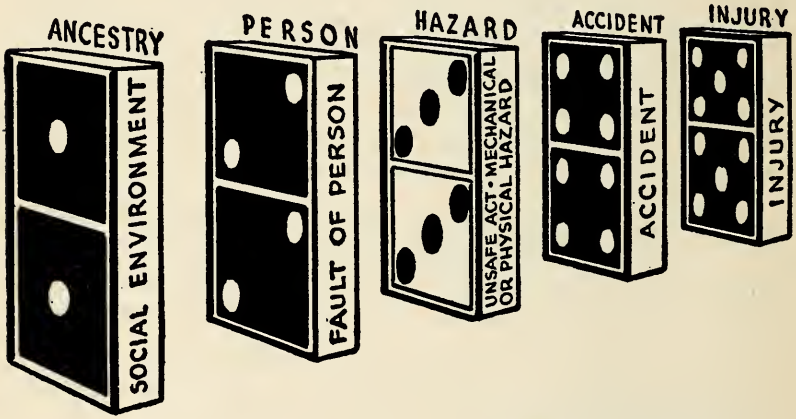
[7] *Industrial Accident Prevention.* New York: McGraw-Hill Book Company, Inc., Copyrighted 1941, p. 13. By permission from the publishers.

injured accidentally. We usually ascribe his injury to hard luck, to the player's hard hitting, or to the opponent's size. We consider it one of the risks of the game. But is this an explanation? We realize, of course, that it is not. As Voltaire asked, "Is chance anything but a name for our ignorance of the cause?" It is obvious that there is a cause, usually a series of causes, for an injury of this type. Following Heinrich's Sequence, it may have been (domino No. 1) that the tackler inherited a stubbornness which prevented him from reporting a former injury of the shoulder; or (domino No. 2) it may have been the fault of the player breaking training rules; or possibly (domino No. 3), it was the result of an unsafe act, not carrying the arms forward at the moment of contact, causing improper contact (the accident domino, No. 4); and (domino No. 5) the broken shoulder.



McGraw-Hill Book Company, Inc.

FIG. 5. HEINRICH'S ACCIDENT SEQUENCE

The removal of the central factor, Unsafe Act, makes the preceding factors ineffective.

Many Accidents Do Not Result in Injury. It should be realized that there are many accidents in athletics and physical education that do not result in injury. Heinrich claims that in industry in a unit group of 330 similar accidents, 300 will

produce no injury whatever, 29 will result in minor injuries and *only one* will result in serious injury. In athletics the basketball player trips and falls, the apparatus may strike a performer in physical education, or a student rises up while dressing and hits his head on the open locker door. None of these results in injury according to the criterion used in this study, namely, "any disability incurred during a physical education activity which prevents the individual from participating in that activity for at least one period or practice session." The proportion of mishaps in sports activities not resulting in injury is not known, but it is assumed to be much higher than that of occupational activities.

We see then, that accidents in sports are caused by a series of factors, and that accidents do not always result in injury. It is obvious that the nature of the participants will play a role in this sequence.

Personal Factor Chief Cause of Accidents. Safety experts agree that most accidents have their origin in the action of the individual—the *personal factor.* Among motor-vehicle accidents, approximately 90 per cent are attributed to the operator, the remainder being accounted for by failure of the vehicle and condition of the highway. Among industrial accidents 88 per cent are caused primarily by the unsafe acts of persons. Although Lloyd and Eastwood did not divide their study on this basis, they ascribe only 10 to 27 per cent to inadequate equipment; it can be assumed that the remainder are attributable to the personal factor.

It is a well-known fact that individuals differ greatly in physical, mental, and emotional characteristics and capacities. These individual differences have a definite bearing upon a person's susceptibility to accidents and injury. It is not within the premise of this text to discuss the numerous and involved characteristics which enter into this phase of the matter, although the subject of accident repeaters and accident-proneness is partially treated in later paragraphs. The reader will find many of these characteristics enumerated in the Accident-Proneness Analyzation Chart on page 49. There are also many underlying causes

of a social, environmental, and inherent nature which are merely alluded to in this text. To treat them adequately would require an exposition dealing with psychology, psychiatry, pathology, and sociology.

The Nature of Athletes

An athlete possesses superior neuromuscular coordination. This coordination, or agility, becomes skill when it is trained to perform a movement or series of movements with dexterity and efficiency, and the higher the degree of skill possessed, the more proficient the athlete. Such skill usually assures the athlete of superior speed and often endurance, two characteristics, plus strength, which enable him to perform beyond the ability of the nonathlete. It is also reasonable to assume that an athlete ordinarily is endowed with a keener sense of sight and hearing, and that he maintains his body in a better state of health than does the ordinary person. In addition, he usually has a highly developed spatial perception, balance, and kinesthetic sense which enables him to "feel" danger in the form of approaching "enemies" and to protect himself when hit or grasped by an opponent. It is this latter sense by which one's own muscular movements are perceived. Besides these obvious physical abilities, the *outstanding* athlete usually possesses certain fine qualities of character and judgment, such as courage, leadership, and levelheadedness, which enable him to act quickly and correctly in a crisis.

These many characteristics are undoubtedly qualities which help one avoid accidents and injury. Athletes, then, would ordinarily be potentially better accident risks than nonathletes. Despite the fact that an athlete may have the ability to avoid many accidents which an ordinary person could not, it is possible that he experiences more nonathletic injuries than a nonathlete because of his daring. In discussing longevity of life among athletes, L. I. Dublin of the Metropolitan Life Insurance Company says: "He (the athlete) is also a more physically adventurous man who is likely at times to take chances, believing in his superior health, strength, and agility, thus exposing himself to un-

necessary risks." [8] Greenway and Hiscock who compared the mortality rates of Yale letter winners with nonathletes confirmed this, saying:

> This suggests that the mortality among athletes is higher than among nonathletes, not because they have been injured by their athletic interests, but primarily due to the fact that they are the type of men who, being full of physical energy, are naturally courageous and expose themselves to danger both in war and in time of peace.[9]

In other words, *many athletes tend to overestimate their abilities.*

Safety Through Skills. All sports require a high degree of agility and skill in performing the various fundamental movements, and persons vary greatly in their innate motor capacities and mastery of skills. Poor neuromuscular coordination, displayed in awkward bodily movements, is undoubtedly the principal *physical* cause of injury among sports participants. One may assume, therefore, that the more skilled a person is as a performer and successful as an athlete, the less accident-prone he is likely to be. In other words, *one's safety in sports depends to a great extent upon one's skill in performance.* This does not mean necessarily that a good athlete will experience fewer injuries than a poor one, but that he will experience fewer injuries *per exposure* than one not so well coordinated.

The principle of reciprocal innervation in muscular control here enters into the picture. When an impulse to contract is sent to a group of muscles, another to relax is sent to the antagonistic muscles so that they will not inhibit the action. This explains in part the stiffness of the beginner and the awkwardness of many performers in the various sports. Awkwardness may be due also to one's mental state, or it may be due to overdeveloped muscles resulting from too much practice in other movements. And so we often judge the caliber of an athlete

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[8] L. I. Dublin, "Longevity of College Athletes," *Harpers,* March, 1928 as quoted by Karpovich in "Longevity in Athletes," supplement to *Research Quarterly,* May, 1941, p. 454.

[9] Edward C. Schneider, *Physiology of Muscular Activity.* Philadelphia: W. B. Saunders Company, 1939, p. 341.

by his ability to relax, by the free movement which he exhibits in performing the required skills. We say that "he makes things look easy." There are at least two major implications involved here: First, a beginner in a sport should always receive scientific instruction. The more dangerous the sport, the more necessary the instruction. Skiing is a splendid example. Literally thousands of beginners are injured each year because they do not follow this precept. Second, a person who remains awkward at a hazardous sport and who seems unable to master it, incurring many injuries, should give it up and try one less hazardous or one to which he is better adapted. Nature usually helps out here, because a person tends to participate only in those sports which he enjoys because of his competency.

Accident Repeaters. Safety engineers have discovered that, as a general rule, less than one third of the employees in industry are responsible for more than two thirds of the accidents, and in Connecticut [10] it was found that 4 per cent of 30,000 drivers figured in 36 per cent of the accidents reported over a six-year period. In fact, in some states Meredith reports that it has been estimated that only one tenth of the population experiences three fourths of the accidents. Statistics are not available regarding the prevalence of accident repeaters among participants of physical education activities, but it is reasonable to assume that a similar situation exists. Every coach and teacher is cognizant of the fact that certain members of the squad or class are "always getting hurt."

What causes a person to be an accident repeater? This question is only partially answered by scientists in the field. It may be that the causes are to be found in a lack of emotional balance or improper attitude, in a lack of knowledge or skill, or in bodily defects. (Add to these "safe practice difficult or impossible" and the causes of all accidents are summarized.) Although the first, lack of emotional balance or improper attitude, is usually considered the major cause of accidents and probably

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[10] Leon Brody, *Personal Factors in Safe Operation of Motor Vehicles.* Center for Safety Education, New York University, 1941, p. 11.

is a basic cause of accident-proneness,[11] it *may not* play a major role in athletics. Almost all players participate because they want to. They enjoy the game and ordinarily become completely absorbed in it. Then, too, there are comparatively few "poor sports" in athletics, and very few persons with bodily handicaps participate. This, then, leaves lack of knowledge and lack of skill as the probable major causes of accidents in sports participation. The lesser is the lack of knowledge. The important factor, then, is skill.

Since the obvious physical cause of accidents and injuries among sports participants is poor neuromuscular coordination, it is safe to say that in sports the accident repeater is usually the awkward performer. Meredith says:

> Undoubtedly some of the awkward are motor morons, hereditarily and incurably awkward, possibly because of defective kinesthetic sense. But with many, the difficulty is remediable in four ways: 1) by due physical training; 2) by overcoming any sickness, malnutrition, or fatigue which plays a part in muscular weakness and incoordination; 3) by making sure that vision, if defective, is corrected by glasses; and 4) by acquiring pride in precision of motion. The latter is all that is necessary in most cases.[12]

Of course, the above facts, with modification, apply to the performer in physical education and intramural activities as well as to athletics.

Emotions and Attitudes Are Important. It should not be inferred that emotional makeup or mental attitude does not play a vital and basic role in the accident-prone person's or accident repeater's record just as it does in a "normal" person's life. It does, but possibly not to the extent in sports participation that it does in industry, in the home, or on the streets. For instance, the factor of inattention, which is the bugaboo of indus-

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[11] Accident repeaters and accident-prone individuals are used synonymously in this discussion, but it should be recognized that they are not identical. One can have repeated accidents and not be accident-prone because one is in a very hazardous position, and one can be accident-prone and not experience an unusual number of accidents because one is in a very safe position. Much depends upon one's environment.

[12] *Hygiene.* Philadelphia: The Blakiston Company, 1946, p. 338.

trial safety, or bad manners, the pitfall of motorists, are seldom found among participants of sports. Other attitude factors, such as wilful disregard of instructions, recklessness, violent temper, absentmindedness, wilful intent to injure, or nervousness and excitableness, are present in varying degrees, but sports participants must learn to control them or be penalized, and serious offenders may even be excluded from further participation. It is generally believed that athletic coaches and physical education instructors are unusually successful in "handling" such cases. Because of his propitious position every physical educator should recognize his responsibility to understand and help these students overcome their tendencies to deviate from the normal. The following quotation from *The Physical Education Teacher and Safety* summarizes well the role played by emotions and attitudes:

> Strong emotional states tend to set the stage for accidents. Such conditions may be brought on by fear, anger, and unusual excitability. Worry, sorrow, tensions, and anxieties limit the normal functioning of the individual. The tendency of students to have accidents has frequently been attributed to poor mental health or to more or less intangible psychological factors, such as conflict between judgment and desire, surplus energy, worry, distraction, foolhardiness, wish fulfillment, and other factors or characteristics of which the student himself may not be aware. Such students may become very depressed, boastful, disinterested, or in various ways preoccupied with their own thought and feelings. Frequently such conditions are accompanied by slowness of comprehension, poor concentration, loss of energy, indecision, poor muscular control, or impulsive activity. To varying degrees these characteristics are manifested by individuals whom we usually identify as neurotic, nervous, high-strung, or tempermental.[13]

In summarization we find that sports are adventurous and satisfy youths' normal demand for risk and daring activity, but the hazards which are not inherent in the game should be elim-

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[13] American Association for Health, Physical Education and Recreation; National Association of Secondary-School Principals; National Commission on Safety Education. Washington: National Education Association (mimeographed), 1947, p. 49.

inated, and every effort should be made to prepare the participant for safe play. The teaching of skills is a basic control in this effort because the more skilled a person is in performing the fundamentals, the less likely he is to be injured. His physical condition, mental attitude, and emotional stability are also controlling factors. The overt reason an accident-prone person or an accident repeater has more accidents is that he acts unsafely more often. Similarly, the person who experiences more accidents is usually injured more often. Finally, it must be remembered that the person who is exposed to danger most often is also most likely to be exposed to accidents and injuries.

Diagnosing Accident Proneness. The National Safety Council has worked out an accident proneness checklist which is quoted with additions for those interested in pursuing this topic further:

The following schedule, which has been adapted from a study plan for accident-proneness in automobile drivers, may prove helpful in diagnosing the accident-prone student. Information concerning some of these items can be gathered from a thorough examination of the student's medical and physical examination records. For others, published or specially-prepared tests may prove helpful. An interview with the student often furnishes valuable information. Parents should be enlisted both for the information they can supply and for the cooperation they can give.

It is quite obvious that the points listed must be further analyzed before they can be corrected. That is, once a pupil is diagnosed as a showoff, the next step will be to find the reason and then to proceed with corrective measures. Recognizing characteristics likely to cause accidents before the accident occurs is especially important.

Accident-Proneness Analyzation Chart

	YES	NO
1. Physical		
a. General lack of strength or weight		
b. Amputated and deformed body parts		
c. Temporarily weakened condition		
d. Paralysis and other related defects		
e. Physical inability to perform the activity		

YES NO

2. Sensory
   - *a.* Eyesight (needs glasses, wear glasses, sensitive to glare, etc.)
   - *b.* Hearing
   - *c.* Reaction time (sight, sound, touch, rapidity of making adjustments, etc.)
   - *d.* Motor control
   - *e.* Scope of attention
3. Mental Sets
   - *a.* Overgrown idea of right
   - *b.* Wilful violation of safety rules
   - *c.* Showoff
   - *d.* Failure to allow for the fallibility of others
   - *e.* Faulty attitudes (noncooperative; feeling that because others do a thing it is right)
   - *f.* Tendency to gamble or take chances
   - *g.* Underestimation of importance of safety
   - *h.* Lacks athletic intelligence
4. Predisposition
   - *a.* Monotony from lack of interest (nothing expected to happen; lowered response)
   - *b.* Preoccupation (daydreaming, thinking about other things, (worry)
   - *c.* Hurry (habitual haste in going to and from activities)
   - *d.* Excitability (irritability, general nervousness, physical and mental blocks)
   - *e.* Distraction (conversing with others, watching unrelated things)
   - *f.* Fear
5. Lack of Knowledge
   - *a.* School safety regulations
   - *b.* Safe use of equipment and supplies
   - *c.* General safety principles
   - *d.* Safe practices in specific activities
   - *e.* Health and sanitation practices
   - *f.* Care and treatment of injuries
   - *g.* Rules of the game
   - *h.* How to use equipment
6. Lack of Skills

	YES	NO
a. Has low innate motor capacity		
b. Motor educability—does not learn motor skills easily and well		
c. Sensory motor coordination—poor hand, foot, and body coordination		
d. Lacks specific skills in various activities.[14]		

Are Some Forms of Exercise Harmful?

Sports vary greatly in the amount of exercise and energy required of participants. They range from the relatively mild sports of horseshoes and croquet to the more vigorous sports of basketball, wrestling, and cross country running. They also vary greatly in the hazards involved. Some, such as table tennis, entail almost no danger, whereas others, such as football or boxing, present a variety of very hazardous situations.

It can be seen that young and old alike should participate only in those activities which are not too strenuous for their particular capacities. In general, it is believed that persons past school age should not participate in the so-called athletic games unless they have been constant performers, as are professional football and baseball players. Similarly, young persons, especially early adolescents, must not participate in those sports or contests which force them to go beyond the bounds of reasonable endurance. Closely related is the precaution that *the participant should be physically fit at the time of participation.* This precaution has been discussed in Chapters V and VI and need not be repeated here, except to point out that one week a person may be declared by a physician to be physically fit for sports participation, the next may become ill and apparently recover, but actually not be in condition to take part. Vaughn S. Blanchard, Director of Health and Physical Education, Detroit Public Schools, concluded, "And finally it seems quite evident that improvement in physical ability is concomitant with a decreased accident rate." [15]

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[14] *Safety in Physical Education and Recreation.* Chicago: The Council, 1941, pp. 21–22.

[15] "Tough but Safe," *Safety Education,* Februarv. 1945, p. 237.

The question, then, of a sport being physically harmful involves two general considerations: is it too strenuous or hazardous for a person of given age and ability, and is he physically fit to participate at a given time? Dr. Arthur H. Steinhaus, noted physiologist, answers the first question as follows:

Barring accidents, which of course occur occasionally in events involving great exertion and bodily contact, there are very few sports whose proper pursuit, even to extremes, brings harm to the body. *What are these few exceptions?* Some surgeons have reported that the cartilage covering bones in the knee and elbow joints of soccer players and boxers, respectively, may become pulped or shredded in consequence of the continual pounding they receive in such sports, even in the absence of accidental injuries. Since cartilage has no blood supply, such deterioration is not repaired. Boxing is further condemned on more serious charges. In most sports head injuries are purely accidental and everyone is sorry. Only in boxing are such injuries planned and gloried over. Jolting or concussion of the brain by any severe head blow may rupture tiny blood vessels. Even in the absence of a knockout or temporary unconsciousness, pin point hemorrhages follow the breaking of the little blood vessels and cause the destruction of a small amount of surrounding brain tissue. This brain tissue is never replaced. Such injury oft repeated adds up until it shows in emotional disorders, in the slurred speech, slowed responses, and shambling gait of the 'punch drunk.' Too many boxers act a bit on 'the punchy side.' Of course, head injuries from football and other games may have the same after effects. Only in boxing, however, do men proceed systematically and deliberately to inflict such injuries. This is a valid charge against boxing. Arguments extolling the virtues of boxing as a builder of courage, speed, etc., often uttered in the slurred speech of an ex-boxer, appear weak and hollow in the face of these condemnatory facts. As a means of self defense it has proved far inferior to wrestling and 'rough and tumble' (jiu jitsu).[16]

The second question, that of being physically fit for participation or competition, is more difficult to answer. In general, however, a person can be considered fit for participation *when*

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[16] Arthur H. Steinhaus, *et al., How to Keep Fit and Like It.* Chicago: Consolidated Bk Pubs, Inc., 1943, p. 17.

declared so by a competent physician, and fit for competition when adjudged so by a coach or trainer. It can be readily seen that neither decision is foolproof. The danger usually arises when the person participates without either the consent of a physician or the advice of a coach. A person is especially foolish to participate in any sport without the approval of a physician, especially if the would-be participant is past school age.

The So-Called Athletic Heart. The most commonly accepted theory among specialists in the field is that a normal person who is organically sound can suffer no permanent ill effects from overexertion in sports activities, that the so-called athletic heart is a myth. Edward C. Schneider, outstanding physiologist of Wesleyan University, declared:

> The recent investigations emphasize the fact that the circulation and the heart can stand strain without harm if the person has been trained gradually to athletic work. In early adolescence, however, when the heart has not become inured to labor, or when the heart has been weakened by some previous infection, the organ will be susceptible to injury from heavy athletics. At all times in life overlooked chronic infections, such as those of tonsils and teeth and rheumatism, may weaken the heart muscle and predispose it to strain during physical work.[17]

Jessie Feiring Williams, long an accepted leader in health and physical education, says:

> The notion that athletic participation produces an enlarged heart which is injurious to health is widespread. In recent years, however, a new view of the heart holds that such conclusion is wrong. Hearts of persons engaging in strenuous sports or hard physical work will enlarge in response to the effort made in order to maintain an active circulation. This enlargement of the heart corresponds to the enlargement of other muscles when actively exercised. Exercise also increases the tone of the heart muscle so that strength and firmness result rather than mere increase in bulk.[18]

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[17] *Physiology of Muscular Activity.* Philadelphia: W. B. Saunders Company, 1939, p. 343.

[18] *Principles of Physical Education,* 5th ed. Philadelphia: W. B. Saunders Company, 1948, p. 70.

Value of Safety in Physical Education

The value of safety education in schools has been proven. It has also been shown that a well-planned program can reduce accidents in the department of health and physical education. A reduction in accidents may result in:

1. A saving of the student's time and of unnecessary pain,
2. an opportunity for the student to enjoy activities more fully,
3. an avoidance of unnecessary administrative expenditure of time and money,
4. a saving of time, worry, and of unnecessary expense on the part of the family.

Since at least 50 per cent of the physical education accidents in the usual situation can be avoided, the values to be received from safety education would seem to be apparent. The safe conduct of physical education is also important to the teacher and coach on at least five different bases:

1. It makes his work more efficient and his teams more successful.
2. It is a timesaver; much time and energy can be lost in caring for the injured.
3. A reputation for carefulness and safety makes the instructor popular with the parents and may be influential in retaining him in, or securing for him, a position.
4. He has the satisfaction of a clear conscience in not sacrificing a player's health and happiness and in preparing pupils to recreate safely in future life.
5. It makes him less liable to suit because of negligence.

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IV

ORGANIZING FOR SAFETY

Because safety education has developed rather slowly and haphazardly the school program is seldom organized and administered in the most efficient and comprehensive manner. Teacher-education colleges and universities are beginning to accept leadership but often have vaguely defined programs as well as inadequate curricula. Many school administrators have not recognized the need for an organized plan of operation and instruction. This chapter is offered to provide guidance for those administrators who wish to check their present organization and to establish a type of plan which is recommended by leaders in safety education.

The Teacher College Program

Each teacher-education college should develop a safety education program in health and physical education in accordance with its pattern of administration and curriculum organization. The following minimum program as proposed by Schneider in his study is recommended as a guide:

1. A course in safety education should be required of all graduates of teacher-training institutions.

2. *Basic or Survey Courses.* A basic or survey course, meeting a minimum of three hours weekly and carrying a minimum of two hours' credit, should be offered as a separate course and be required of all graduates of teacher-training institutions. The minimum aspects of safety education which should be included in the basic or survey course should be: school-bus safety, sources of outside aid (agencies), accident statistics, safety tests, texts and workbooks, vacation safety, visual aids, and water safety.

3. *Special Courses.* Additional training in safety education should be required of specialized teachers in physical education, home economics, industrial arts, physical science, and social science. Special courses should be offered in materials and methods in safety education, first aid, driver education and/or driver training, swimming and life saving, and administration and supervision in safety education. A minimum of two hours weekly with two hours of credit should be allowed for each special course in safety education.

4. *Supervision.* The responsibility of supervising and coordinating the whole safety education program in the teacher-preparing institutions should be delegated to the Department of Education, if possible; otherwise, to the Department of Health and Physical Education.

5. *Allocation of Instruction.* The instruction in safety education should be offered to two- and three-year students during the second year of their training and to four-year students during the second, third, or fourth year.

6. *Preparation of Teachers.* Teachers in charge of the safety courses in teacher-preparing institutions should possess a minimum of three-term or three semester hours' preparation in safety education. A more desirable minimum would be six-term or six semester hours.

7. *Instructional Materials.* Teacher-preparing institutions should undertake the development of instructional materials in safety education. Lesson plans of the same quality and quantity required in other teacher-training courses should be required of students in safety education.

8. *Integration of Safety Education.* In addition to instruction in safety education through the basic and special courses, instruction should be integrated with the following courses: Administration and Supervision (general), Extracurricular Activities, Health, Industrial Arts, Materials and Methods in Safety Education, Physical Education, and Social Studies.

9. *In-Service Training.* Short-term or intensive courses in safety education should be sponsored by teacher-preparing institutions for teachers in service. Credit for these courses should be given on the same basis, that is length of time spent in course, as other courses.

10. *Cooperation with Local Schools.* The teacher-preparing institutions should cooperate with local schools in providing for the in-service training programs in safety education.

11. *Outside Agencies and the Program.* Wherever it is feasible, both public and private agencies should be utilized for the con-

tribution of materials and devices to the teacher-preparing program in safety education. The services or devices which may be accepted are: advisory service, bibliographies, demonstrations and exhibits, dual-control cars, instructional materials, lecturers and speakers, and safety conferences.[1]

Teacher-education institutions must give active and profound consideration to this necessary phase of the curriculum. It must insure that individuals being prepared for the teaching profession recognize the place of instruction in safety within the general framework of the total instruction program.

Principles of Organization and Administration

At the outset, the head of the Department of Health and Physical Education and other school administrators must recognize the fundamental truth that a successful safety education program is the result of a carefully planned structure in which all individuals clearly understand their responsibilities. Such structure must be based upon proven principles of organization and administration which grow out of a sound educational philosophy. Brown points out that the principles of good administration are universal, inasmuch as success in every type of undertaking is dependent upon them. To be termed "good," administration must be at once democratic—offering to each individual and group the opportunity to cooperate—and the product of responsible leadership—leadership whose effectiveness may be judged by the extent to which it is able to delegate responsibility. This delegation of responsibility is not limited to the faculty alone; it is extended, under proper guidance, to the students as well, and provides them with an opportunity to learn by doing. Good administration makes use of every resource at its command, not only capitalizing upon the peculiar talents of the school faculty, but enlisting the cooperation of students, patrons, various levels of administrative personnel, and other groups. Another important duty of administration is to provide a safe and adequate physical en-

[1] Nathaniel O. Schneider, *Teacher Preparation for Safety Education.* Center for Safety Education, New York University, Ed. D. Final Document, 1940.

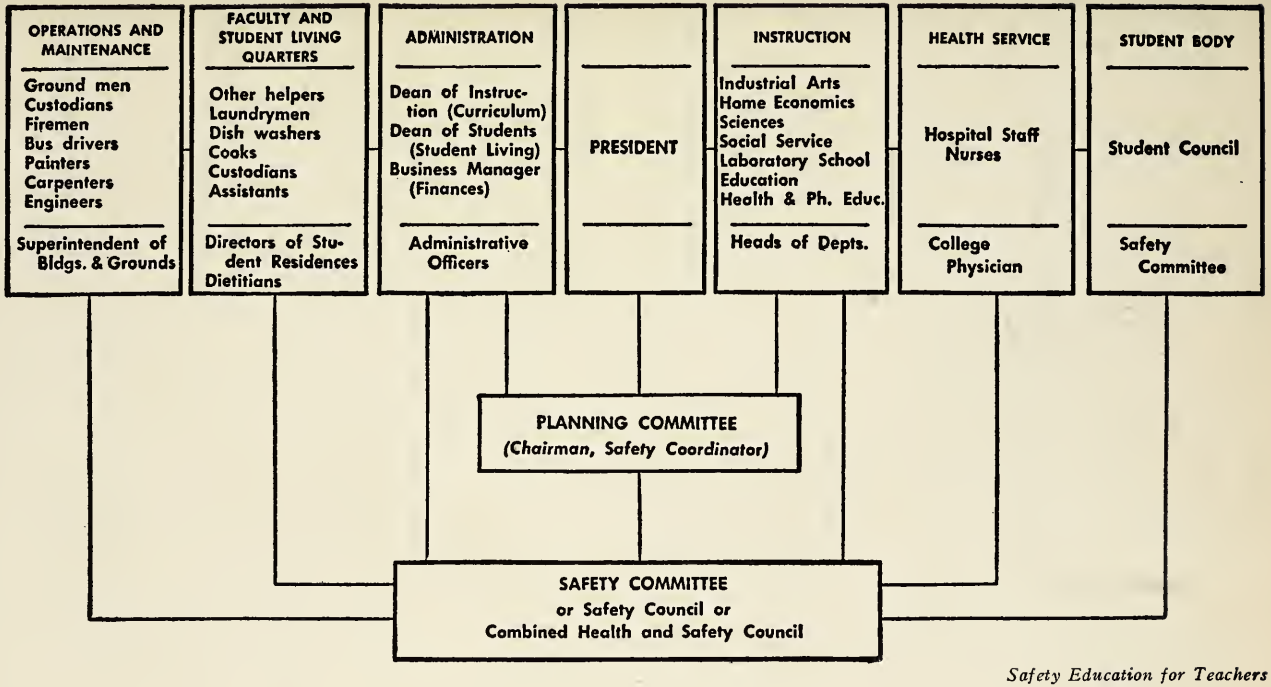

FIG. 6. CHART OF ORGANIZATION

From *Safety Education for Teachers*, Part One, National Commission on Safety Education and American Association of Teachers Colleges of the National Education Association, page 29.

vironment for the student body. Last but not least, good administration is sound to the core, each of its parts being encouraged to contribute to the whole, and each receiving recognition in the measure of its contribution.[2]

Organizing and Administering the Teacher-Education Program

To implement the above principles the following administrative activities have been selected and identified as valuable in establishing an educationally sound basis for a program of teacher education in safety:

1. Secure the cooperation of the State Commissioner of Education in launching and stimulating a local program, either alone or as a unit in a state-wide program of safety education.

2. Organize an administrative committee for teacher education in safety, consisting of department heads and other staff members who have a unique contribution to make in the conduct and development of the program.

3. Acquaint the administrative committee with the basic nature, content, objectives, and expected outcome of programs in teacher education in safety, by such procedures as

a. Outlining and discussing its value as a major phase of the total process of instruction.

b. Considering the safety program as a means of training for effective and joyful living in modern society.

c. Recognizing the program as a means of serving the state by protecting the health and conserving the lives of human beings.

d. Employing the program as an instrument of public relations to work with other community agencies in serving the state.

4. Appoint from the administrative committee a subcommittee of preferably three to five members to work out the details of the safety program. The chairman of the committee

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[2] Edwin J. Brown, *Secondary School Administration, Its Practice and Theory.* Boston: Houghton Mifflin Company, 1938.

should serve as coordinator of the program. It is likewise advisable to request the chairman of the Department of Education to serve as coordinator of the teacher-education phase of the program, and the chairman of the Department of Physical and Health Education to serve as associate coordinator in charge of the practical safety program to be conducted in the institution. The chairman of the Department of Physical and Health Education should be selected to conduct safety procedures in the plant of the teacher-education institution because of the nature of his work and its relation to safety.

5. Call a general faculty meeting for the purpose of critically evaluating and approving the plans formulated and recommended by the subcommittee and presented by the coordinator.

6. Outline to the coordinator of the program his specific duties and add suggestions which might aid him in performing these duties. The following suggestions are valuable in promoting a successful teacher-education program in safety:

a. Determine an adequate amount of time to be allocated for teacher education in safety.

b. Determine whether safety shall be an integrated phase of the teacher-education program, a separate course of study, or a combination of these two methods of teacher education.

c. Allocate practical and theoretical work in safety education to the several departmental courses of study, or combine these two methods of teacher education.

d. Determine the content of safety courses and recommendations concerning safety materials that may be treated in related courses.

e. Make recommendations concerning the amount of credit in safety education necessary for graduation.

f. Make recommendations concerning the type and nature of a course or courses in safety education in the teacher-education curricula with respect to purpose, objectives, content, status, and outcome.

g. Compile course materials and recommendations concerning safety instructional aids and devices. Con-

struct teaching units and lesson plans for teacher education in safety in regular safety courses and in related courses where safety materials may be treated through integration.

h. Propose and direct research in safety in terms of community surveys, program needs, methods and techniques in safety instruction, and related factors.

7. Confer with the coordinator and the program committee regarding specific objectives to be attained by teacher preparation in safety.

8. Plan with the coordinator and the program committee the nature of that phase of the safety program that shall exist in the physical plant of the teacher-education institution. The following suggestions are concerned with the practical application of these safety procedures:

a. Organize clubs, fraternities, sororities, departments of instruction, and other agencies within the institution and community, for cooperation in the safety program.

b. Develop an accident-reporting system for the institution.

c. Appoint a safety council or committee composed of advanced students to work with the administrative committee in promoting a local and practical safety program.[3]

Steps in Organizing a School Safety Program

The organization of the school safety program now can be visualized as a definite procedure involving a series of steps. These are listed for the guidance of the safety planning committee as follows:

1. First set up the type of organization within the Department that will best cope with the safety problem. Regardless of the size of the school, a plan of attack is necessary. Some type of a committee organization is recommended. Such an "Athletic Safety Committee" (it can be labeled by some other name) should include:

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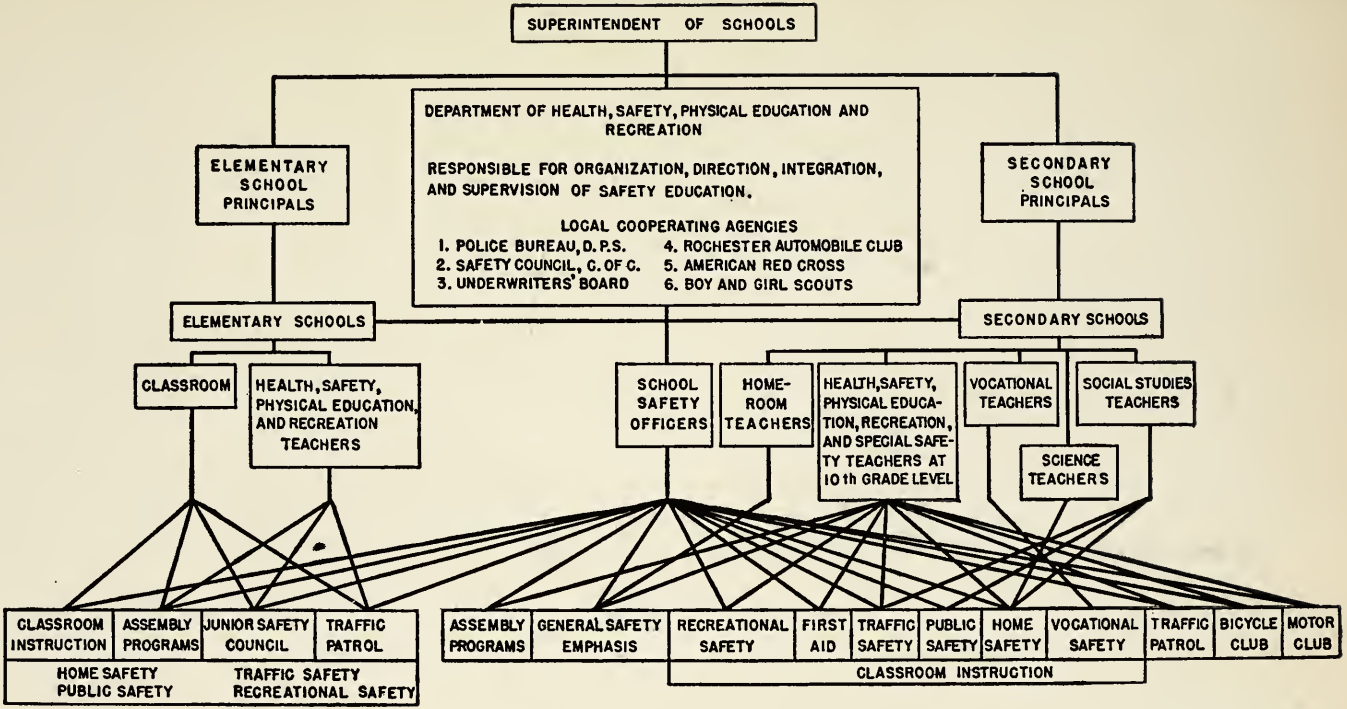
[3] F. J. Henry and C. C. Hawkins, *Constructing the Teacher-Education Curriculum in Safety.* Center for Safety Education, New York University, 1941, pp. 4–6. Their plan of action is found in more detailed form here.



Safety Education, p. 57.

FIG. 7. A PLAN OF ORGANIZATION FOR THE SCHOOL SAFETY PROGRAM

a. Members of the health and physical education staff,

b. Representatives of the Student Leaders' Club,

c. Representatives of the Lettermen's Club.

This committee should, of course, be a subcommittee of the general School Safety Council.

2. The next step is to determine where, why, how, and to whom the accidents in the Department are occurring. This requires the establishment of a thorough and efficient accident-reporting and record-keeping system. (See p. 69.)

3. The Athletic Safety Committee should then draw up a definite safety program, in accordance with the results of the accident record plus the opinions of safety experts, the staff, and committee. (Suggestions for this procedure follow.)

4. Establish a definite system of caring for the injured in accordance with school policy. This procedure should include such vital issues as who shall render first aid, who shall notify the parents, and how the injured shall be transported. All persons concerned must be made completely familiar with the correct procedure. Sufficient first-aid supplies must be made available at all times and at strategic locations. Some schools find students' first-aid clubs very helpful in caring for the injured.

5. If the health instruction curriculum is to include various other phases of safety, the nature and placement of this material must be determined by the instructors concerned, in conjunction with the principal, curriculum committee, and the School Safety Council.

6. Provision should be made for some form of athletic accident insurance. (If your state does not support such a plan, it may be that your league or community can evolve some workable type of medical reimbursement.)

7. Provide sufficient and appropriate safety education materials:

a. Recommended textbooks and reference materials.

b. Current safety pamphlets such as those furnished by the federal and state governments; motor clubs; the National Safety Council; and the Center for Safety Education, New York University.

c. Visual aids such as posters, motion pictures, film strips, and charts. (See lists provided by the National Education Association, National Safety Council, and Center for Safety Education, New York University.)

8. Determine methods of evaluating the program.

a. Reduction of accidents.

b. Development of attitudes.[4]

Responsibilities of Department Members. No administrative plan, regardless of how carefully it is planned, can succeed without the delegation of responsibility to those who are a part of the department. It is difficult to outline the responsibilities and duties of all people in the Department of Physical Education because of variance of administrative set-ups and programs, but the following suggestions are made in the hope that each school will be able to make proper adaptations. In general, the responsibilities of all individuals in the department may be grouped as follows:

1. Providing and maintaining a safe environment in which the health and physical education program is conducted.

2. Organizing and conducting safety services for the students.

3. Influencing safer behavior of the students through safety instruction.

The responsibilities will naturally overlap, but, in general, each teacher or coach will be responsible for his or her own class or team activity. As the Safety Council points out, the difference between the responsibilities of the supervisor and teacher is one of degree rather than kind. In many elementary and rural schools and in smaller high schools one person serves in both capacities, which eliminates the problem of allocation of responsibility.

Safety Coordinator. Because so many physical educators are selected to serve as safety coordinators or chairmen in their respective schools, it may be judicious to outline the duties.

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[4] Don Cash Seaton, *Safe All Around.* Center for Safety Education, New York University, 1946, p. 2.

1. The interpretation of the philosophy and objectives of the school safety program to teachers, principals, pupils, building custodians, and parents.

2. Collection of data on student accidents through an accident-reporting system, and the careful study of such data to determine local problems and points of emphasis. More general accident data should also be collected through the local Police, Fire Department, and other sources.

3. Interpretation of accident data through published materials (such as monthly accident reports going to the individual schools) and faculty meetings.

4. Preparation or provision of teaching aids to give to children the information they must have if they are to avoid accidents. Obviously the content of the material will be determined by a study of the student accident data. The manner in which the material is presented will vary with the system. A special course in safety education may be desirable, safety materials may be integrated in selected courses, and current materials may be provided through the school library.

5. Encouragement of faculty-supervised cocurricular safety activities to insure children opportunities to "learn by doing." These activities may be safety councils, safe drivers' schools, motor traffic clubs, school safety patrols, and others.

6. Periodic surveys of buildings and grounds to keep them in as good condition as possible, thereby aiding in giving to pupils maximum protection while on school property.

7. The development of definite cooperation for child safety between home, community, and school.

8. Cooperation of Police in securing adequate traffic signs, signals, and traffic direction near schools.

9. Supervision of the school safety patrols and other school safety organizations.[5]

Coach or Instructor Responsibility. The National Safety Council provides the following list of suggested responsibilities for the coach or teacher of physical education.

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[5] National Safety Council, *Safety Teaching in the Modern School.* Chicago: The Council, pp. 4–5.

1. To keep informed about and to introduce as rapidly as possible the best safety practices in the physical education field when applicable to his situation.

2. To keep informed about and to recommend the best safety equipment in the physical education field.

3. To keep informed about, to provide, and to insist upon the optional use of student protective equipment.

4. To inspect the physical education plant according to a definite time-and-item schedule. (Some areas need to be inspected daily, and annual inspection may suffice for others.)

5. To guide and encourage all others connected with the physical education program (such as the principal and classroom teacher) to set up suitable safety objectives.

6. To keep complete accident records and report these to the central office.

7. To use accident records in planning the curriculum and in correcting errors in environment and equipment.

8. To serve on school safety curricular and administrative committees.

9. To be prepared and ready to conduct individual or group safety conferences in the field of physical education.

10. To confer with parents on individual students' safety needs.

11. To inform the school personnel and community regarding the scope of the safety program in physical education.

12. To be ready and able to plan safe play areas within limits of available resources—money, space, equipment, etc.

13. To cooperate fully in school-wide safety activities such as fire drills.

14. To equalize, as far as is possible and desirable, the power of opponents in individual and group competition.

15. To permit no student to partake in strenuous activities without the approval of school or family doctor and to plan physical activities suited to each student in the light of his health examination.

16. To evaluate continuously the safety practices of himself, his pupils, and his staff.

17. To insist upon more exacting care of minor cuts and bruises so that the possibility of complications will be minimized.[6]

Student Learning Through Participation. The National Safety Council also makes the following splendid suggestions regarding students' learning safety through participation.

Properly organized and conducted safety services are activities through which the pupil may learn. Safety services as such are a necessary program procedure. When the safety services are used as an instructional as well as a service agency, the values are increased. An effective method of teaching the 'where, when, how, and why' of such services is to allow the pupils to participate in the safety service program. Through such participation a pupil should become actuated in safe procedures and practices. For example, the health examination should inform the pupil of his present status in regard to the type of activity safe for him to engage in. It should also instill in him the desire always to pre-check his physical and mental status to determine if participation in an activity is safe for him.

Health and sanitation services should develop in the pupil both an understanding and an appreciation of the responsibility for personal cleanliness.

The student should be made aware, through the plan of classification, of the safety implications to himself and his opponent of competing with pupils of equal size, age, and ability.

Through setting up a training and conditioning schedule students can be informed of the correct precedure and become aware of the importance of conditioning both body and mind in personal safety habits. Such items as sufficient 'warm-up' exercises, maintaining a warmed-up state during activity, gradual progression of routine activities, and ceasing activity before the 'tired or exhaustion' point is reached, all have definite implications in terms of safety education.

Students should not be permitted to take part in organized competition until they have a thorough knowledge of the rules pertaining to the conduct of the game and the safety implications of those rules.

Students should participate in keeping accident records. Whenever possible it is desirable to have the injured student fill out the report card. Whether or not this is done, teacher and student

[6] *Safety in Physical Education and Recreation,* p. 10.

should go over the report carefully in order to learn how the accident could have been prevented.

Selecting and providing adequate properly-fitting equipment to be worn during the activity may be used as a learning experience.[7]

Keeping and Using Accident Records. Although accident records on a national scale are available, every Department of Health and Physical Education should maintain its own accident-reporting system if an intelligent solution of the local accident problem is to be made. Keeping such statistics "in the head," so to speak, and acting on misconceptions provides a very unreliable basis for a safety program. No two schools will present identical accident hazards, nor will the various sports necessarily have similar incidences to those of national records. Each administrator and coach will, however, want to be able to compare each activity of his with the national record or with the experience of other schools of similar standing. (The mechanics of a system of record-keeping is given in Chapter V under First Aid.)

Accident reports should be analyzed periodically and used as a guide for the improvement of instruction and control. The National Safety Council lists the following specific uses of accident records:

1. To find basic subject matter for a safer, more effective physical education program, and to motivate the pupils in this program,

2. to discover what safety information, habits, skills, and attitudes are most needed by a specific group of students,

3. to acquaint oneself with the accident problems of most vital importance to the students participating in the physical education program,

4. to utilize accident experience at a time when a student is most receptive to its teaching,

5. to aid in the evaluation of the effectiveness of safety teaching,

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[7] *Safety in Physical Education and Recreation,* p. 61.

Read Carefully **INSTRUCTIONS** **Fill in Completely**

A. Use Part **A** of the form to report *all* student accidents. Injuries requiring a doctor's care, or keeping a student out of school one-half day or more, should be reported regardless of where the student was when injured (on school property, enroute to or from school, at home or elsewhere).

B. Use Part **B** of the form to report additional information on injuries to students while under the jurisdiction of the school. School jurisdiction accidents, however slight, should be reported promptly. Unless otherwise defined by administrative ruling or court action, school jurisdiction accidents are those occurring while students are on school property, in school building and on the way to and from school.

IMPORTANT: In order that maximum use be made of accident reports, it is essential that the accident be described in sufficient detail to show the unsafe acts and unsafe conditions existing when the accident occurred. The description should answer such questions as: What was the student doing at the time of the accident? (Playing tag or football, operating lathe, cutting lawn, etc.) Was he using any apparatus, machine, vehicle, tool or equipment? How was he using it? Would it have been safer to do it some other way? Was another person involved in the accident in any way?

(For further information on the preparation of the original accident report and the monthly summary sheet, see *Safety Education Memo No. 3*—Student Accident Records and Analysis.)

STANDARD STUDENT ACCIDENT REPORT FORM

Part A. Information on ALL Accidents

1. Name: _____ Home Address: _____
2. School: _____ Sex: M ☐; F ☐ Age: ____ Grade or classification: ____
3. Time accident occurred: Hour ____ A.M.; ____ P.M. Date: _____
4. Place of Accident: School Building ☐ School Grounds ☐ To or from School ☐ Home ☐ Elsewhere ☐

5. NATURE OF INJURY

Abrasion	____	Fracture	____
Amputation	____	Laceration	____
Bruise	____	Puncture	____
Burn	____	Scratches	____
Concussion	____	Sprain	____
Cut	____		
Other (specify)	____		

PART OF BODY INJURED

Ankle	____	Hand	____
Arm	____	Head	____
Back	____	Knee	____
Elbow	____	Leg	____
Eye	____	Nose	____
Face	____	Scalp	____
Finger	____	Tooth	____
Foot	____	Wrist	____
Other (specify)	____		

DESCRIPTION OF THE ACCIDENT

How did accident happen? What was student doing? Where was student? List specifically unsafe acts and unsafe conditions existing. Specify any tool, machine or equipment involved. _____

6. Degree of Injury: Death ☐ Permanent Impairment ☐
7. Total number of days lost from school: _____ (To be filled in when student returns to school)

Part B. Additional Information on School Jurisdiction Accidents

8. Teacher in charge when accident occurred (Enter name): _____
Present at scene of accident: No: ____ Yes: ____

9. IMMEDIATE ACTION TAKEN

First-aid treatment	____	By (Name): _____
Sent to school nurse	____	By (Name): _____
Sent home	____	By (Name): _____
Sent to physician	____	By (Name): _____
		Physician's Name: _____
Sent to hospital	____	By (Name): _____
		Name of hospital: _____

10. Was a parent or other individual notified? No: ____ Yes: ____ When: ____ How: ____
Name of individual notified: _____
By whom? (Enter name): _____

11. LOCATION

		Specify Activity
Athletic field	____	_____
Auditorium	____	_____
Classroom	____	_____
Corridor	____	_____
Dressing room	____	_____
Gymnasium	____	_____
Home Econ.	____	_____
Laboratories	____	_____
Sch. grounds	____	_____
____ shop	____	_____
Showers	____	_____
Stairs	____	_____
Other	____	_____

Remarks

What recommendations do you have for preventing other accidents of this type? _____

Signed: Principal: _____ Teacher: _____

(National Safety Council—Form School 1) Printed in U.S.A. 11M—847

National Safety Council

FIG. 8. STANDARD STUDENT ACCIDENT REPORT FORM

6. to make changes in the structure and use of the building and equipment,

7. to provide facts in questions of liability.[8]

National Safety Council Chicago

STUDENT ACCIDENT SUMMARY Month of_____ Year_____

City_____ School_____ No. of school days in above month_____

Form Student Acc. 2 (1941) (There were ____ accidental deaths this month. Copies of original report cards covering them are attached.)

CLASSIFICATION	STUDENTS KILLED AND INJURED, BY GRADES														Days Lost All Grades
	All Grades	K's	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade	9th Grade	10th Grade	11th Grade	12th Grade	Un-class.	
1. TOTAL ACCIDENTS															
SCHOOL BUILDINGS															
2. Classrooms & auditorium															
3. Laboratories															
4. Vocational shops															
5. Domestic science dept.															
6. Gymnasium—basketball															
7. " —other															
8. Swimming pool & showers															
9. Dressing-rooms & lockers															
10. Toilets & washrooms															
11. Corridors															
12. Stairs & stairways															
13. Other building															
SCHOOL GROUNDS															
14. Apparatus—swings															
15. " —slides															
16. " —teeters															
17. " —bars															
18. " —other															
19. Athletics—baseball															
20. " —football															
21. " —soccer															
22. " —track events															
23. Other organized games															
24. Unorganized Activities — Running															
25. Unorganized Activities — Scuffling															
26. Unorganized Activities — Other falls															
27. Unorganized Activities — Other															
GOING TO OR FROM SCHOOL															
28. Motor vehicle—bicycle															
29. Other motor vehicle															
30. Other bicycle															
31. Other															
HOME															
32. Falls															
33. Burns, scalds, explosions															
34. Cuts & scratches															
35. Other home															
OTHER															
36. Motor vehicle—bicycle															
37. Other motor vehicle															
38. Other bicycle															
39. Other street & sidewalk															
40. Playgrounds (not school)															
41. Other places															
ENROLLMENTS AND DAYS LOST															
42. Enrollments															
43. *Days lost—This month's accidents															
44. Days lost this month from previous month's accidents															

Report made by_____ Title_____

One copy of this report should be sent each month to the National Safety Council, 20 North Wacker Drive, Chicago, covering all schools in the city that maintain records.

Rep. 5M—1046—NSC Printed in U.S.A.

National Safety Council

FIG. 9. ACCIDENT REPORT FORM SUMMARY

[8] *Safety in Physical Education and Recreation*, p. 50.

Suggested Aim and Objectives of Safety Education

In selecting the aim and objectives of safety education in physical education, it is patent that they should be consistent with those of general education. Furthermore, safety education must look to sociology and philosophy for the desirable outcomes of education. From these, objectives that can most easily be accomplished through the type of activity represented by physical education and which are consistent with the local situation to be served can be decided. Aim, as used here, refers to the ultimate goal. It may be unattainable but it is desirable as an objective toward which to strive.

Education. A general aim of education which appears to be acceptable at the present time is one expressed by the Educational Policies Commission:

> Education, therefore, seeks to encourage the mastery of such knowledge, and acquisition of such attitudes, and the development of such habits as make a socially desirable way of living likely to be followed by the learner.[9]

Physical Education. An aim of physical education that has been very popular was stated by Williams: "The aim of physical education is to provide an opportunity for individuals and for groups to act in situations that are physically wholesome, mentally stimulating and satisfying, and socially sound." [10]

Safety Education. The aim of safety education stated by the White House Conference on Child Health and Protection is consistent with the above purpose of general education and acceptable for use:

> The development of such safety habits, safety attitudes and safety skills as will cause a decrease in the number of accidental deaths and injuries to children, produce safer adults for the future, and give to each individual freedom from fears and conditions which may restrict his enjoyment of life.[11]

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[9] *The Purposes of Education in American Democracy.* Washington: National Education Association, 1938.

[10] *Principles of Physical Education,* p. 249.

[11] White House Conference on Child Health and Protection, *Safety Education in Schools.* New York: D. Appleton-Century Company, Inc., 1932, p. 24.

For Teachers of Health and Physical Education. A more specific aim for teachers of health and physical education in training would be "To develop among prospective teachers of health and physical education a knowledge of safety problems, efficient safety skills and habits of performance, and proper attitudes that will insure safer programs for their future pupils."

It is recognized that each teacher and school should select, formulate, and activate those objectives best suited to the local situation. The selection of these objectives would be based upon accepted educational procedures, including among others the following: an analysis of existing materials in terms of objectives in general education and safety and material in various courses of study, and data secured by various fact-finding organizations; social responsibilities of the students; needs of the students, determined by analysis of accident records and hazards; and analysis of the interests and desires of the students. The objectives should be analyzed in terms of the aim, and should be consistent with those of general education; they should be concise but inclusive; they should be possible and desirable of attainment; they should serve local purposes.

The following objectives have been determined in light of the above criteria and are offered for guidance,

Objectives of Teacher-Education in Safety.

1. To acquaint prospective teachers of physical education with the meaning, nature, philosophy, and increasing importance of safety education.

2. To develop in student teachers of physical education a thorough understanding of the problems, principles, procedures in planning, administering, supervising, and of teaching an effective program of safety in health and physical education in their respective schools.

3. To assist teachers in health and physical education in developing and transmitting wholesome attitudes, habits, and ideals for safe and effective living in a society which provides an increasing amount of recreation.

4. To create situations in which student teachers of health

and physical education may secure information and knowledge and develop skills and attitudes that will enable them to become safer and more capable teachers.

5. To study the causes, parts injured, severity, and incidence of accidents in physical education, and to learn the proper methods of control for safer participation in such activities.

Objectives of Safety in Physical Education.

1. To develop among participants of physical education activities a wholesome safety-consciousness which will reduce the number of avoidable accidents but will not restrict unreasonably the enjoyment and benefits of the activity.

2. To teach fundamental leadership, equipment-and-skill controls, and the physical, mental, and emotional facts which are related to accident prevention in physical education.

3. To provide for the development of proper safety skills, habits, and attitudes in the health and physical education program.

4. To provide safe facilities and adequate and proper equipment and supplies to carry on a successful program.[12]

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[12] Adapted from Henry and Hawkins, *Constructing the Teacher-Education Curriculum in Safety,* p. 13.

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V

SAFETY THROUGH ADMINISTRATION

THERE ARE a large number of administrative controls affecting the safe conduct of a school or college health and physical education program. In general, these controls can be divided into two major groups: those which are imposed from within the school organization, and those which are imposed from without. The so-called "outside" administrative controls would include: national rules governing sports contests, league or conference regulations, state laws or regulations of the state chief school officer. The "inside" administrative controls, as discussed in this chapter, include such items as the health examination, recommended number of contests, correct size of classes, policy of rendering first aid, safe transportation, and many other school safety problems.

National Sports Rules

Possibly the greatest single force for safety in athletics has been the establishment of national rules by which sports are played. Such rules are usually established by national committees with a view to improving the game and reducing the number of possible injuries. The major groups interested in establishing such rules are: The National Collegiate Athletic Associations, The National Section on Women's Athletics of the American Association for Health, Physical Education and Recreation, the Amateur Athletic Union, and the various professional leagues. Many national associations interested in certain sports, such as the United States Lawn Tennis Association and the

American Bowling Congress, also exert an influence upon the safe conduct of their respective sports. In general, schools follow the rules established by the particular group represented, but they may choose to play under those of another association. For instance, almost all schools and colleges play under the professional baseball rules, and many secondary schools play under the intercollegiate football rules. *For safety's sake it is recommended that all schools play under the rules designed especially for their respective groups.*

High-school fatality statistics that tend to support this principle were presented before an annual meeting of the football committee of the National Federation of State High School Athletic Associations.

> While no claim is made for the significance of the following figures (because of the comparatively small number of fatal injuries), here are the facts in connection with fatalities in games in which high schools played under Collegiate Rules and games in which high schools played under high school rules. For the years in which these statistics are available, there was an average of seven-tenths of one (.7) fatal injury for 100,000 participants for games played under the Federation Code and 4.25 fatal injuries for 100,000 participants in high school contests which were played under Collegiate rules.[1]

One criticism which can be directed at some of these rules committees is that too often they have based their rules for safety upon insufficient data. Other sports organizations should follow the lead of the National Collegiate Athletic Association which has attempted to base its safety rules upon scientifically collected data since 1931.

League Regulations. The National Collegiate Athletic Association, the major governing body among colleges since 1905, and the National Federation of State High School Athletic Associations, established in 1920, are the two national organizations exerting the most influence upon interschool competition and the establishment of sports rules in this country. The health and safety of players has been a primary objective of these organizations since their inception.

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[1] *Complete Minutes*, 1947, p. 2.

K. L. "Tug" Wilson, Secretary-Treasurer of the National Collegiate Athletic Association and Commissioner of Athletics, Western Intercollegiate Conference, makes the following observations regarding safety as a concern of the N.C.A.A.:

It is significant that the very origin of the National Collegiate Athletic Association is identified with a concern for safety in sports. In 1905 intercollegiate football was being condemned for its brutal and admittedly dangerous aspects and a conference was called of college and university heads who, in advance of the meeting, were strongly disposed to abolish the sport as a collegiate activity. The result of that meeting was a decision to reform rather than outlaw the game, and from this came the Football Rules Committee of the N.C.A.A., whose initial concern from its inauguration may be said to be standards and rules that assure the safety of participants. Its enactments against the flying wedge, as an early instance, and other types of play which were thought to provoke injuries are examples of that primary interest.

Its concern for proper equipment is another example. . . . Through the years the Football Rules Committee has encouraged and legislated in favor of equipment providing maximum protection for players. One result of that sponsorship has caused great current concern in the committee—that so much protective equipment has been provided it can actually be of danger to an opponent. Now a sort of negative legislation, limiting the type and extent of protective equipment, is being sponsored. Rules in all other sports, as written by N.C.A.A. Committees, follow the same pattern of primary concern for the safety of participants. Boxing is an oustanding example, from its restrictions on men with undue experience, to its protection for an injured fighter, as is wrestling, which bars a great variety of holds considered likely to invite injuries.

Most schools have also found it advisable to form leagues with schools of similar classification to provide equitable competition and friendly association. Such leagues as the Western Intercollegiate Conference of colleges and the various State High School Athletic Associations have established their own rules governing eligibility, length of seasons, and various other regulations, including many that are definite safety factors. Space does not permit a résumé of these restrictions, but a number of illustrations are given in the following chapters.

Athletic Benefit Plans

The athletic benefit plans adapted by various state high-school athletic associations have been a major factor in the control of injuries in athletics. An analysis of these plans in effect throughout the nation made by Forsythe indicated that they fall into approximately five classifications. "While the chief objective of all of them is that of aiding schools to meet the costs of intramural or interscholastic athletic injuries, yet they are realized by slightly different means." [2]

The Wisconsin Plan requires that students pay a fee of 50 cents to $1.00 for scheduled injuries, protection ranging from $2.00 to $300. Those schools receiving benefits averaging 75 per cent or less for a three-year period secure their coverage for one half the regular fee. For a small additional fee, a limited hospital benefit, summer sports program, or transportation coverage is included. To date this is the only state which has extended the plan to include elementary schools, with a fee of only 10 cents per enrollee. Among those states having similar plans are California, Kansas, Michigan, Minnesota, and Nebraska.

The New York Plan differs essentially from the above in that it operates on a per-sport basis. The fee varies from 50 cents per player for tennis, to $2.00 for football, and the scheduled benefits are somewhat higher than those of most other states. The protection plan in Pennsylvania is similar to that of New York.

In the *Iowa Plan,* the state has formed a regular mutual insurance company incorporated under the laws of the state. The schedule of benefits is essentially the same as the original plan developed by Wisconsin.

The New England Plan is unique in that several states have combined to form a benefit fund. This is the only instance of more than one state forming an organization for the purpose of operating a benefit plan. In other respects it is the same as the Wisconsin Plan.

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[2] Charles E. Forsythe, "Athletic Accident Benefit Plans," *Journal of Health and Physical Education,* March, 1941, p. 137.

Commercial Insurance Plans are in operation independently in some states, whereas in others insurance companies have contracted with the local state association, and a master policy is taken out by the organization. In most instances the premiums of the commercial companies have been at least twice those of the state associations.

Accident Benefit Plan Values. Probably the most important benefit of these plans, next to relieving parents of the financial burden for athletic accidents, is that the system invariably makes the school officials safety-conscious. An accurate accident-reporting record must be kept, which makes self-diagnosis and evaluation more common. Schools with unusually high accident rates are investigated and, if the poor record persists, they are sometimes denied renewal of contract. State tabulation of results makes it possible to judge schools in relation to one another and for the state to compare its program with other states. Another important benefit is the provision for better care in the case of more severe injuries. Often the parent or school is unable to bear the expense for treatment, such as X-ray, which is generally provided under a benefit plan. Another development is that the physician has been given more responsibility for the decision as to whether or not an injured player should return to the competitive sport, because plans will not make a second payment to a school for an injury which has already been compensated for unless there has been a re-examination and a permit card issued signed by the examining physician.

Individual playing equipment and facilities have improved, rules have been modified for the better, the importance of warm-up periods has been emphasized, and the many other precautions advocated have made athletics safer for participants in those states supporting such plans.

Officials

An official is directly responsible for the safety of the players through the interpretation and enforcement of the rules of the game. The degree to which the rules for safety are enforced

depends entirely upon the judgment and skill of the persons acting as officials. The caliber of officials, especially in high-school athletics, has greatly improved during the last few years. This improvement has been due largely to the establishment by state associations of a plan for the registration, training, and classification of officials.[3]

College officials are similarly controlled by the various conference authorities. Usually, however, the college system is better in that it goes one step further and *assigns* the official for the various games. The method of assignment varies, but in general it has provided better officiating. It should be noted that an increasing number of high-school leagues use this same method for the assignment of officials.

State Laws

At least thirty-seven states have legislation requiring health and physical education to be a part of the elementary and secondary school curriculum. In addition, in two states this requirement is part of the State Board of Education regulations. Requirements range from complete five-day-a-week programs with physical examinations and health instruction, such as in Illinois, to only one hour a week in some states. These programs may cover one or all of the following items: credit, time allotment, financial support, and selection of teachers, coaches, and supervisors. Every state, so far as can be determined, requires the teacher of physical education and the athletic coach to be a duly licensed teacher.

School and Teacher Liability. In most states the probability of liability law suits is rare. Protection, however, for the physical education instructor and the program is to be found in an understanding of the principles of liability. By backing up this understanding with a sound program of safety, these unfortunate occurrences will be kept to a minimum.

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[3] In Wisconsin the Athletic Benefit Plan will not pay an injured player if the officials in charge of the contest do not qualify according to the requirements for Officials' Registration.

The prevailing principle of law in the United States is that a school district or a school board is not, in the absence of a statute, subject to liability for injuries suffered by pupils or others during and in their attendance upon school. . . . [p. 17] In other words, so far as the board's liability is concerned it is of no significance to most American courts that a teacher or a school administrator has been grossly negligent, has failed miserably in his job as a teacher or administrator, and has failed to take even the most elementary precautions. In virtually all of our states the courts will not permit the injured pupil or person to succeed in a suit against the board of education. [p. 19]

The general common law rule states that a school district is not liable for injuries unless it consents. [p. 24]

Now the rule is universal in the United States that a teacher, principal, superintendent, or other employee of a school board is liable for his or her own negligence. . . . [p. 43] Negligence has been defined as the failure to act as a reasonably prudent person would act under the circumstances. [p. 45] [4]

Defenses against liability suits, as outlined by Rosenfield, include:

Proximate Cause. For the negligent person to be held liable, the act of negligence must be a proximate cause or a substantial factor in bringing about the injury.

Assumption of Risk. By participating in certain activities, the injured party has assumed *normal* risk incident upon the activities. He cannot hold another liable for the results of the normal risks he has voluntarily assumed.

Contributory Negligence. Negligence of the injured party is also a defense against liability.

Vis Major. There are accidents caused by uncontrollable events of nature (Acts of God) and not by the negligence of the sued party.[5]

Regarding the use of equipment Rosenfield says, "The

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[4] Harry N. Rosenfield, *Liability for School Accidents.* New York: Harper & Brothers, 1940.

[5] Pre-Convention Conference on Safety Education, American Association for Health, Physical Education and Recreation, *Abstract of Proceedings.* Center for Safety Education, New York University, 1940, pp. 2–5.

moral is an obvious one: do not permit the use of defective equipment in the gymnasium or any other place." [6]

In some instances the Court, as in California, has held the school health and physical education *curriculum* to be unduly dangerous and of unreasonable requirements. Regarding this, Frances J. Moench, Director of Physical Education of Cortland State Normal, says,

> Unfortunately, there have been established certain court cases as precedents which indicate a trend toward the possibility that laymen may become the ultimate judges of what can be offered in the physical education curriculum. Let us not be stampeded into eliminating from our curriculum the vital instructional material necessary for the attainment of our objectives, or we will be liable for, and in this case guilty of, a negligence which is greater and more far-reaching.[7]

The question of supervision seems to hinge upon the degree and character of such supervision. "A football coach who knowingly sends an injured player back into a game is clearly negligent; and if he did not know of the injury, he is negligent for his ignorance of it." [8] Competence of personnel also has a bearing. In New York state the Court held the school district liable when a janitor was selected to supervise noonday recreation. Some courts have held that there is a duty of *inspection* of athletic equipment. Some states have also held that the same degree of care must be exercised by teachers during *recess periods* as during classroom instruction. The question of unsupervised play activity, therefore, assumes two aspects; one when the fault is the board's for failure to provide sufficient supervision, and the other when the fault is the teacher's for failure to supply such supervision as was possible under the circumstances.[9]

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[6] *Ibid.*, p. 57.

[7] "Safety Precautions *vs.* Liability," *Journal of Health and Physical Education*, February, 1942, p. 87.

[8] Rosenfield, *Liability for School Accidents*, p. 64.

[9] Rosenfield, *Liability for School Accidents*, p. 71.

First Aid and Treatment of Athletic Injuries. Rosenfield reports that a number of court decisions clearly indicate that school officials have a duty to render first aid, but no treatment beyond that. A lay teacher should attempt to give only the merest emergency treatment, and should not continue to dress a wound over a period of time. Courts have refused to permit school boards to pay for continued nonemergency treatment on the ground that their legitimate scope of action ended with the rendering of first aid. The question of liability for the *treatment of athletic injuries* by the coach or trainer, a common practice in most schools and colleges, is not so clearly defined. A California attorney general ruled that the district could not provide hospital or medical care to athletes beyond first aid. Rosenfield points out that the scope of the treatment must necessarily vary with the person who is rendering it. This, plus the moral obligation, would indicate that those persons rendering continued treatment to athletes should be well qualified to act.

Liability Insurance Protection for Teachers. School districts outside of New York and New Jersey, and possibly California and Washington, cannot protect their teachers from damage suits based on negligence. Teachers may, however, protect themselves if they are willing to pay the premium set by the insurance companies. The National Education Association [10] urges teachers to examine a policy carefully before purchasing, since most insurance companies insert one or more exemptions. Teachers would do well to consult the State Insurance Commission before taking any policy.

Use of Waiver Forms for Participation. Although the waiver form provides extremely limited protection, there are certain psychological advantages connected with its use. It assures parental knowledge and permission. It may also discourage the filing of suits by parents who, unless they consult an attorney, are likely to think that they have waived all rights in court.

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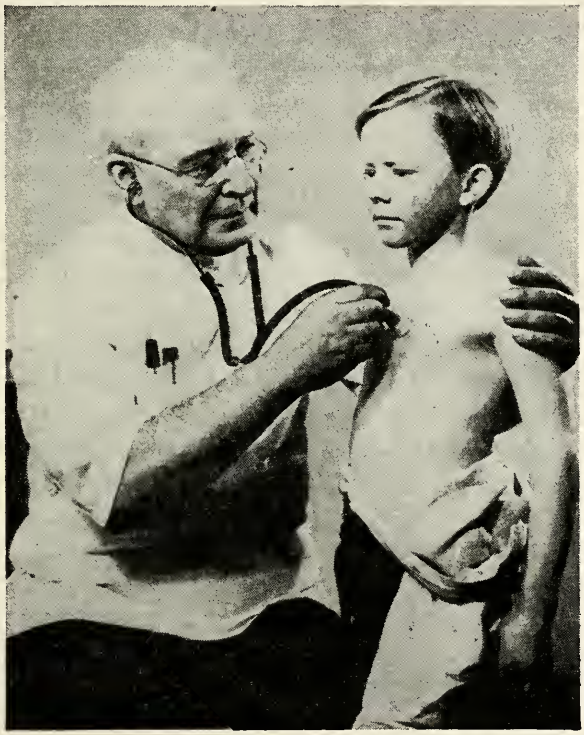
[10] *Teacher Liability for Pupil Injuries.* Washington: The Association, 1940.

Administrative and Program Controls

The administration of school physical education may be defined as that part of the school program which is concerned with the organization, management, regulation, and control of personnel and materials so that they will function smoothly, efficiently, and effectively as an integrated whole in achieving the desired goals.[11]

The principal task of administration in physical education, then, is to integrate the objectives of the program, the activities of the



National Safety Council

FIG. 10. SAFE STARTING POINT

The health examination, if properly administered and followed up, forms the real basis for a safe and intelligent physical education and athletic program.

[11] Jackson R. Sharman, *Modern Principles of Physical Education.* A. S. Barnes & Co. Inc., 1937, p. 190.

pupils and instructors, and the facilities and equipment used. The success of the program would be judged by the effectiveness in reaching these objectives. One of the stumbling blocks in attaining these objectives may well be an ineffective safety program and an excessively high accident incidence.

An analysis of existing studies in this field and the findings of the author's own study [12] indicate a number of desirable and effective administrative and program controls for the Department of Health and Physical Education.

Health Examinations. Among the controls set up for the Department of Health and Physical Education, the health examination is one of the most important single administrative precautions for the prevention of injury. Lloyd and Eastwood found that the accident incidence for schools having such examination was 11.6 per 1,000 exposures, as compared with 17.4 for schools *not* having such examination, a 39 per cent lower incidence. Outstanding teachers of health and physical education, when polled by the investigator, unanimously agreed that such an examination was a primary safety control and should be required periodically of all participants in the physical education program and of all members of interschool teams before participation in each sport. Ben W. Miller, Executive Secretary of the American Association for Health, Physical Education and Recreation, pointed out that the trend was away from superficial examinations done annually, to less frequent but more thorough examinations supplemented by an intelligent program of detection and referral at all times. D. Oberteuffer, Professor of Physical Education of the Ohio State University, Columbus, Ohio, commented that the frequency of periodic examinations should vary with the age of the participants. Although examinations of athletes before participation in each sport are admittedly desirable, it has not been found practical to administer them in most situations.

The examination should be recorded on the cumulative

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[12] Don Cash Seaton, *Preparation of a Course in Safety Education for Teachers of Health and Physical Education,* Ed. D. Final Document, New York University, 1947.

record, which is kept on file in the Department where it can be used constantly for guidance of the student's program. This blank should contain a space for the recording of the injury-accidents experienced by the student. Such a record may prove helpful in studying the underlying causes among accident repeaters and in determining means of correction. It is important that the examining doctor or doctors be familiar with the physical requirements of each sport, to enable them to eliminate those students who have conditions which might prove dangerous in a specific activity.

The health examinations should include items that affect a person's safety, such as colorblindness, range of peripheral vision, and reaction time. Although such items are usually a part of the testing program in the school's driver-education course, very few schools have such a course, or it all too often reaches only a small segment of the school population. It is therefore desirable that such psychophysical tests be included in the regular health examinations, which ordinarily reach all of the pupils. In those schools and colleges in which the Department of Health and Physical Education conducts an extensive testing program, it might be desirable to include psychophysical tests there.

Because of the importance of *vision* in the role of safety, it is recommended that an effort be made to provide tests of the range of peripheral vision, colorblindness, depth perception, and possibly double vision and dark adaptation, in addition to the customary visual acuity test. Floyd R. Eastwood of Purdue University, one of the country's outstanding leaders in safety in athletics said, "Tests of depth perception and peripheral vision should be given in the medical examination, and *practice* on split vision should be instituted." The services of an ophthalmologist would be required to make such tests on a scientific basis, but since the school's role is assumed to be one of screening only, the more common driver-testing devices, under direction of a nurse or other competent person, are adequate to provide such examinations. These devices can be purchased or borrowed from safety organizations or constructed in the school shop.

National Conservation Bureau

FIG. 11. LET THEM KNOW OF THEIR DEFICIENCES THAT LEAD TO ACCIDENTS

Psychophysical testing devices such as this will not only provide the one examined with a knowledge of his deficiencies that may lead to accident proneness, but may inform the athletic coach of unusually well-developed senses among prospective athletes.

Although *reaction time* has probably received undue and disproportionate emphasis in the testing of drivers, it nevertheless is an important factor in safe living and is especially vital in physical education. Such a test can usually be incorporated in the health examination or testing program. Keller [13] reported that athletes responded faster than nonathletes, also that baseball, basketball, football, and track athletes comprised a group significantly faster in reaction time than the group including gymnasts, swimmers, and wrestlers, but that no significant difference was found between the sports within these groups. Dr.

[13] Louis B. Keller, "The Relation of Quickness of Bodily Movement to Success in Athletics," *Research Quarterly,* May, 1936, pp. 146–155.

Harry R. McPhee, team physician at Princeton, commented regarding this subject, "Because of his subnormal reactions, he is injury fodder of a malicious type. His awkwardness will result in injury not only to himself but to other players. A wise coach will encourage him to take a physical education course in coordinating exercises before going out for football.[14]

Hearing is almost universally included in the health examination, but its relation to safety is seldom pointed out to the unfortunate ones. This brings us to the next point, that not only should the examination or tests include such items, but that *students should be made aware of such deficiencies in relation to safe living, and informed of proper methods of compensation or correction.* The real value of the health examination lies in effective education at the moment of examination and during the follow-up. It is at these times that the relationship between deficiencies and the student's safety should be brought home. If the coaches and instructors of physical education are also aware of these deficiencies, a safer and more profitable program can be planned for the individual.

Since health, or physical fitness, is not a static factor, it must be recognized that an examination does not preclude the possibility of a player's competing when he is not fit. In order to insure safety by this method, an examination would be required before each participation, which would be administratively impossible. For this reason, each individual's participation following the health examination must rest upon the expert scrutiny of the coach or instructor, supplemented by consultation with the individual. The latter usually takes place only when the participant reports some injury or ailment or the instructor suspects there is something wrong. In fact, through constant association, there are many signs which indicate to the teacher or coach unnatural conditions of which the student himself may not be aware, and which may be missed by the physician who seldom observes the student at play. Manner of response to a command and lack of "life" are common warnings of illness.

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[14] "Prevent Football Injuries," *Scholastic Coach,* September, 1948, p. 47.

The observant instructor becomes adept at spotting such ailments and in distinguishing between the real thing and "goldbricking." In the last respect, experience indicates that the instructor should err on the side of leniency when judging a student's fitness for participation in the required physical education program. To let an occasional malingerer slip by is far less harmful than to harm irreparably a truly ill or injured student who is not capable of adroitly pleading his case.

Physician's Permission for Readmittance. Students absent from school for three or more days because of illness or injury should present a *physician's written approval for readmittance* to physical education classes, intramurals, and interschool athletics. This precaution has been accepted in principle almost universally, but the physical education departments have found its administration so difficult that few schools follow the procedure. The administration is relatively simple for those schools supporting a school physician, but a practical method must be worked out for those not having one. The use of a form similar to the one in Fig. 12 is recommended. The use of such a permit guides the physical educator in planning a scientific and safe reconditioning period for the returning student and protects the department from possible criticism should something go wrong.

PERMIT TO RESUME PARTICIPATION IN ACTIVITY PROGRAM

Township High School Date .....

..... has been out of school for .... days because of
(*name*)
....
her
In my opinion it will be safe for him to resume the activity program as follows:

1. Physical education classes .....
(*date*)
2. Intramural or interschool athletics .....
(*date*)

Remarks: .....

(*Signed*) .....
Physician

FIG. 12. PHYSICIAN'S PERMIT TO RESUME PARTICIPATION

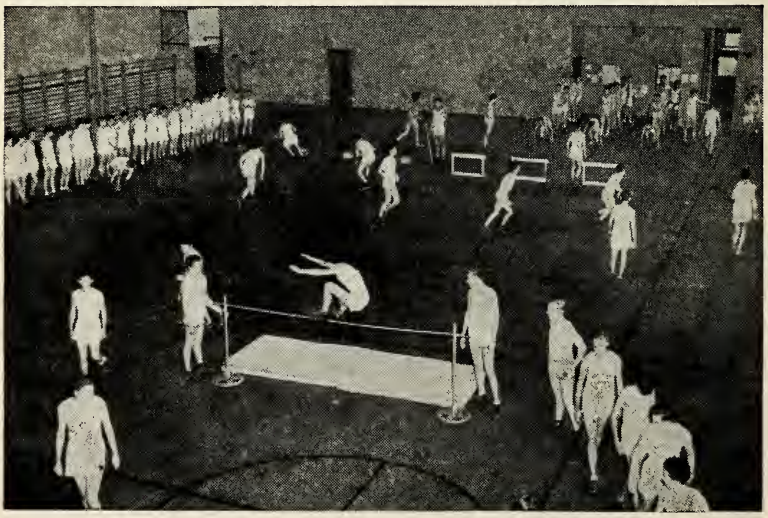
Homogeneous Grouping. *Homogeneous grouping of students in physical education and athletics is helpful in reducing the number and severity of accidents.* The extent of such grouping from the safety standpoint is debatable, but most leaders feel that it is desirable to divide the sexes above the third grade for the majority of activities, and to segregate each grade for participation. Lloyd and Eastwood found that grouping by age is a superior safety technique to grouping by combinations of height, weight, and according to the judgment of the teacher. Such classification, however, would be administratively impossible in many schools. Some schools find it advisable in physical education to divide these groups still further, through the use of physical tests or other selective methods, into various classifications of adeptness. This method of classification is commonly used in the teaching of swimming, gymnastics and tumbling, wrestling and boxing, and similar sports because of the danger in superior performers competing with the less adept, as well as because it makes instruction easier and more effective. Coaches almost universally find it necessary and advisable to segregate their squads according to ability, not only as a means of improving team play, but as a safety measure.

Age and Weight Limitations. It is neither fair nor safe for mature, twenty-year youths to compete against immature fourteen-year-olds. Nor is it sporting or safe for 200-pound college players to compete in contact sports against lightweights. For these reasons most high-school conferences have limited the age of eligibility to twenty, and both colleges and high schools have fostered lightweight or junior varsity teams for interschool competition. Likewise it may not be safe for young and immature students to compete in strenuous interschool competition. For this reason a few states have set minimum age limits for competition in certain sports. For example, in New York a boy must be fifteen years old before he may compete in football, cross country, or ice hockey, and in Michigan he must be sixteen years of age or above to compete in cross country or any track event of 440 yards or more.

Co-recreational Activity. So far as is known no studies

have been made of the accident incidence in co-recreational activities. It would seem logical to assume, however, that the tendency would be toward an increased rate because of the inherent urge of the males to demonstrate their prowess and the girls to feign weakness. The desire to "show off" is definitely an accident producer. Danford, Director of Health and Physical Education, University of Florida, commented, "On the other hand, we have found the boys holding back in order not to injure the girls." Instructors in charge of co-recreational activities should be aware of this possibility of an increased accident rate and take steps to curb overzealousness.

Physical Tests. Maturity, strength, speed, endurance, and agility are factors not usually measured by the health examination, but they should be considered when students are being classified for safer participation. Therefore, physical tests which measure these qualities are also helpful in planning the students' program, and can be considered a safety factor.



National Safety Council, Chicago Public Schools NEA Journal

FIG. 13. SAFETY CALLS FOR GOOD ORGANIZATION OF ACTIVITIES

Although this class is large for the available space, it is so well organized by squads and conducted by student leaders that a maximum of safety results.

Such classification as that mentioned in the two categories above makes instruction easier, provides continuity in the program, and assures adequate progression of skills—all of which make for safety.

Size of Physical Education Classes. No other problem has plagued the administration and the physical education departments more than the one of overcrowded classes. Physical educators have been demanding smaller classes for years, but there still remain too many overcrowded physical education classes throughout the country. That overcrowding causes accidents is a fact accepted by most authorities who have studied the problem. Every effort should be made to *gauge the size of classes according to the limitations of the facilities and equipment and the availability of teaching and supervisory personnel.* Although educational authorities advocate that the size of physical education classes not exceed that of the academic field, many instructors are required to teach classes far in excess of the normal load. When an instructor is required to handle a class with more than approximately thirty-five students, it becomes very difficult to conduct the class so as to avoid excessive accidents among the participants. Under these conditions many instructors devote most of their time to safety supervision rather than to instruction.

School administrators are urged to schedule physical education classes first on the student's program so that they will be homogeneously assigned to classes of proper size. Often, when the scheduling of physical education is relegated to last, unequal distribution results because there is usually but one gymnasium, swimming pool, or play field available so that students cannot be shifted to other classes within the department. Physical educators are also urged to refuse to endanger the students by scheduling overcrowded classes.

Qualified Teachers. As a safety measure, *only qualified teachers* of physical education (men for boys' activities and women for girls') should be employed to instruct physical education classes, intramurals, and interschool athletics. The term "qualified" is used advisedly, because the qualifications vary

among states, but, in general, it is assumed to mean certified or licensed by the State Department of Education to teach physical education. The National Federation of State High School Athletic Associations has the following rule, "A school shall not permit coaching by anyone who is not a certified teacher regularly employed by the Board of Education and whose entire salary is paid by that body; or who has fewer than three regular periods of classes, gymnasium or study-hall duty per day." [15] Forsythe says, "Frankly, if a school cannot provide a man or woman who is properly trained to teach the sport desired, that sport should not be an activity of its athletic program." [16] It is quite common in some states to violate this rule by selecting athletic coaches from the faculty who do not hold physical education certificates. Such practice may lead to an increased accident incidence.

Instructors and coaches should be aware of the school policies relating to safety and well-informed regarding the safe practices of the activities they are selected to teach. Before selecting a coach to "fill in" for some sport until a qualified person can be secured, the administrator should consider the hazards involved. Not only should they be qualified, but, according to Lloyd, Deaver, and Eastwood:

> Teachers must be made safety-conscious and trained to recognize hazards, know how to prevent them where possible, and what to do when an injury occurs. They must recognize the signs of overtraining as well as lack of training, and know when a student is physically fit to enter or reenter a game. They must know the expectancies of injuries for various sports, and prevent unnecessary injuries. Full-time teachers of physical education give more satisfactory safety results than part-time teachers.[17]

Conduct Only Activities for Which Adequate Protection Can Be Provided. *Schools should not sponsor or conduct those sports or activities* in physical education, intramurals, or inter-

[15] *Handbook,* 1946, p. 12.

[16] *Administration of High School Athletics.* New York: Prentice-Hall, Inc., 1939, p. 281.

[17] *Safety in Athletics,* p. 205.

school athletics *for which adequate protective equipment and safe facilities cannot be provided.* Many small schools are guilty of promoting activities which require expensive equipment that they are unable to afford. Also, large schools often conduct activities in areas that are entirely inadequate from the standpoint of space and safety. When he is contemplating the conduct of an activity where either the facilities or equipment are not adequate or safe, the school administrator must always weigh the possibilities of injuries in the light of the benefits to be derived. Likewise, when unusual numbers of accidents are occurring, the administrator should *first* investigate the adequacy of facilities and protective equipment. One Director of Athletics, Dr. L. C. Butler, Colorado State College, points out that this principle applied by other schools is a good method of improving facilities. "We have two high schools in our area who are not playing home basketball games because other league members refuse to subject their players to the poor, unsafe facilities offered. Both schools are planning new gyms this year!"

Closely allied with this problem is that of climatic conditions. School administrators should conduct a seasonal program of sports which is suited to the climatic conditions of the particular community. Daily activities of the physical education and sports program must be adjusted to the adverse weather conditions of snow, ice, rain, fog, heat, and cold. Alternate activities or spaces should be available for such occasions.

Safety Instruction. *Safety instruction in health and physical education should be an integral part of the program.* This instruction would range from the formal teaching program of the health class to the informal warnings of the coach to his players as they rush into the showers, and would include direct and correlated teaching, the use of visual aids, and the posting of rules and regulations and posters.

Every well-ordered department will establish certain safety rules and regulations for the proper use of the facilities. Observance will depend upon the effectiveness of the educational program, enforcement, and accident experience.

At an early meeting of each class the teacher should in-

struct the members concerning the rules and regulations for health and safety, the reasons for their existence, and the methods of compliance. Many schools find it helpful to place this information on the same mimeographed sheet with the course objectives and grading plan that is given each student at the beginning of the class.

The health class instruction, now a part of every modern school's program, should include pertinent materials on safer participation in sports, similar to the contents of this text.

Various hazards of the facilities often warrant warning signs, such as:

1. Never enter pool alone.
2. Keep locker doors closed.
3. Don't jump from steps.
4. Dry off in this room only.
5. Walk—don't run.
6. Use this equipment only when instructor is present.
7. Keep right.
8. Open door slowly.
9. Remove football shoes outdoors.

Fire Drills. *Fire drills must be thoroughly planned, organized, and carefully practiced in all areas of the athletic plant.* Correct exits for each area including emergency obstructions and the proper clothing procedure for each activity must be worked out and practiced in accordance with general school fire-drill plans. If the weather is favorable, students can carry on the drills in gym clothes, but in inclement weather they probably should be permitted to secure coats. If the drill occurs while students are showering, dressing, or in the pool, they should be instructed to secure sufficient clothing and participate. The instructor must be sure to carry his roll book and take the roll to make certain that all students have left the building. *In extremely hazardous situations it would be advisable for the administration occasionally to conduct fire drills among the spectators.* Such drills could be most easily conducted during intermission. If the weather is favorable, most spectators will

welcome the opportunity to stretch and get some fresh air or have a smoke.

Suitable Activities. *In planning the physical education program, activities should be selected which are safe for the given sex, age level, and pupil abilities.* It is understood, of course, that because of their inherent qualities, very few sports activities are entirely safe, but there are certain recognized limitations. For instance, touch football is considered unsafe for girls, cross country too strenuous for elementary-school children, and horse polo too hazardous for unskilled riders. One proven method to reduce the accident incidence is to have a large variety of activities, provided they can be properly supervised.

The writer wishes to make it clear that he would not eliminate hazardous games. As it is so ably expressed by Howard Danford of Florida State University: "If we select only activities which are safe, we will devitalize the program. Much of the value of some activities lies in the hazards. Our job is not to eliminate all these hazards, but to help youth overcome them." In discussing the trends in high-school athletics, Forsythe says, "It is very probable that, in the near future, an accounting will be taken to determine whether high schools are sponsoring athletic activities which do not properly belong in the high school category of sport."

Adapted Activities. Activities which involve a variety of different interests, skills, social situations, and emotional outlets should be provided, and students assigned to these various activities according to capabilities and to need. Many students have organic defects or physical impairments which prevent them from taking part in all phases of the regular program. In these cases the examining physician should prescribe suitable activities and the Department of Physical Education provide needed supervision and instruction within the regular class activity or in special classes. Present educational policy does not call for *complete* segregation of handicapped children, which poses the added problem of protecting, as well as developing, these youngsters.

Supervision at All Times. All activities, including free play periods of the physical education program, should be adequately supervised by the teaching staff at all times. From the standpoint of safety, this control is a necessary one. According to Lloyd, Deaver, and Eastwood inadequate supervision during the activity accounts for 40 per cent of the improper leadership controls which cause 31 per cent of the total accidents. Many school systems make it mandatory that a teacher be present at all times for every activity of the program. "Teaching" supervision makes for greater safety than "sitting" supervision. Although records do not show conclusively that the incidence of accidents is higher during free play, they do disclose that the severity index is much higher.[18] Experience indicates the desirability of supervision at this time. (See the beginning of this chapter for liability in case of inadequate supervision.)

Clubs sponsored by the department, such as those for skiing, camping, archery, rifle, riding, and others, must be supervised by a member of the department or faculty because of their potential dangers. Special rules of safe conduct must be established and observed. If they are supervised by a faculty member who has not had physical education training, the procedures should be worked out with the physical education department.

Interschool Competition for Girls?

There is no uniform agreement among physical educators with regard to the advisability of interschool competition for girls. Many feel that such competition is just as desirable for girls as for boys, and others feel that the danger is too great. A number of the experts interrogated by the investigator felt that such competition was desirable in the less strenuous games, but too dangerous in team sports. Most women instructors favor the interschool play-day sports-festival type of competition, which is more of a social event. One woman director of a state teachers college, Ruth H. Bloomer, Connecticut College, ex-

[18] Morris' study in Rhode Island High Schools showed this period to be the most serious of the four, and Lloyd's study showed an average national loss of 6.2 days per accident, as compared to an average of 4.2 days loss for all accidents.

pressed the feeling of several others when she said, "Believe it possible to have safe and educationally-sound interschool competition, particularly on the college level." A junior-high-school woman instructor expressed the opinion that competitive sports are not harmful if they are conducted under competent, trained

Scholastic Coach

FIG. 14. COMPETITION SAFE FOR GIRLS?

Should girls compete in interschool athletics? Whether the answer is yes or no, special care must be taken to condition the players well, match teams of equal caliber, and to provide sufficient protective equipment and the finest officiating.

teachers and are limited to light schedules with nearby schools, excluding overnight trips.

The National Federation of State High School Athletic Associations is opposed to such competition and explains its stand as follows:

The National Federation has based its policy on interscholastic athletics for girls on the findings of the various groups of women's physical training directors. In general, widespread intramural activ-

ities have been encouraged and interscholastic athletic activities in the major sports have been discouraged. Play days and camp activities have been recommended as a substitute for the more strenuous contests which result when the reputation of the school is based on the outcome of the contest. This applies especially to games such as basketball, football, baseball and soccer. At the present time 12 states prohibit interscholastic basketball for girls and 25 states prohibit basketball tournaments. In addition to these, there are fifteen other states which do not have a rule to prohibit such tournaments but where no tournaments are reported. In the states of Georgia, Maryland, Missouri, Iowa, South Carolina and Tennessee, tournaments for girls are held and interschool contests are common. As far as the National Federation is concerned, the Executive Committee has been instructed to refuse to sanction any interstate basketball tournament in which girls' teams compete.

Those states which have eliminated interscholastics for girls base their action on the following observations: Most of the women physical training directors advise against such activities. This includes the Women's Division of the American Association of Health and Physical Education and Recreation. There are several objections. One of these is the matter of health. It is felt that the strenuous activities involved in games such as girls' basketball can be justified from the health standpoint only when the contest is not associated with the intense nerve and emotional strain which accompanies contests where the reputation of the school is involved. When these conditions surround the contests, it is a very difficult thing for the director of athletics to strictly enforce health rules. When the reputation of the school is at stake, the immediate physical condition is too often considered a minor matter. There are too few school systems where adequate health examinations are required and where good health conditions are made a part of the contest. In the opinion of many physical directors the interscholastic factor causes the recreational value of the game to disappear and too often leads to the breakdown of good sportsmanship.

It is felt further that all of the benefits which may be attributed to interscholastic contests for girls may be derived from games and play days which are not designed to attract a large crowd. It is doubtful whether the skills and mental characteristics which result from engaging in strenuous widely publicized contests is conducive to the development of those characteristics which are associated with cultured womanhood. Under ideal conditions and expert supervision, there may be a place for such activity but under existing circumstances there may be better ways of securing the values of such

games. The contests are too often sponsored with the chief interest on the amount of gate receipts, rather than on the problem of whether desirable holdover characteristics are being engendered in the participants. Gate receipts can not be increased without giving the public what it desires. It desires plenty of action and consequently the boys' rules or a modification of them and men officials and coaches are often demanded.

These states which have eliminated interscholastic activities for girls have usually substituted a desirable program of intramural and social and play day activities designed to promote the development of the social graces and health practices which will have a lasting influence on the lives of the participants.[19]

If one considers the question purely from the standpoint of safety, it seems reasonable to assume that such competition is inadvisable, because interschool competition in general is more hazardous than intramurals or interclass play. It is for this reason, probably, that 62 per cent of the experts polled agreed that it is not advisable to conduct interschool athletic competition for girls, other than the modern play-day activities.

Interschool Competition for Grade-School Boys?

Interschool athletic competition among boys below the tenth grade is not considered advisable by authorities in medicine and physical education. In 1946 the Society of State Directors for Health and Physical Education passed the following resolution:

Inasmuch as pupils below the tenth grade are in the midst of the period of most rapid growth, with the consequent bodily weaknesses and maladjustments, partial ossification of the bones, mental and emotional stresses, physiological readjustments, and the like, be it, therefore, resolved that the leaders in the field of physical education should do all in their power to discourage interscholastic competition at this age level because of its strenuous nature.

Be it further resolved that where school systems continue to foster a program of interscholastic sports competition for pupils below the tenth grade, that they be urged to limit it to pupils who are physiologically mature as measured by roentgen pictures of the de-

[19] *Handbook,* pp. 32–33.

gree of carpal bone ossification, advance chronological age plus beard growth, or some other indication of physiological maturity.

Dr. C. L. Lowman, outstanding orthopedist, questioned a large number of other orthopedists regarding their approval of the above resolution. He found that 85 per cent of the 403 individuals answering agreed that competition should be limited to the physiologically mature.[20]

Competent Officials

Competent officials in sufficient numbers should be provided for all sports competition in which there is an element of danger. Although players should be instructed to play according to the spirit of the game as well as the rules, it is the obligation of the official to maintain this atmosphere and to enforce the rules most rigidly, especially where danger is involved. In high schools, officiating indicates the least degree of efficiency from the point of view of safety. It is recommended that only "certified" or "approved" officials, who realize that their duty extends beyond the mere calling of fouls for the safe conduct of the game, be employed for interschool contests. Officials should be held responsible and accountable for excessive accidents, if it seems clear that other causal factors are normal.

Probably the poorest officiating takes place in the regular physical education classes and intramural contests. The department should bend every effort to provide well-trained officials for these contests. One of the best solutions lies in the selection and training of student leaders. The National Section of Women's Athletics of the American Association for Health, Physical Education, and Recreation has been conducting an intelligent and energetic plan for the upgrading of officials within their ranks. Their program to select and train student leaders is particularly commendable.

Women or girls only should officiate girls' team sports. It

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[20] "The Vulnerable Age," *Journal of Health and Physical Education,* November, 1947, p. 635.

is generally felt among women instructors that male officials lack the necessary understanding of the psychology of girls' competition to be safe officials. It should be noted that this principle is applied only to *team* sports, because many women instructors feel that male officials are satisfactory or more desirable for such individual or dual sports as tennis, golf, and badminton. It is interesting to note that among the women polled by the writer, the opinion on this point was almost unanimous, whereas 37 per cent of the men disagreed with the principle. Typical of this dissent among the males were the following: "I think men are far better officials than women. They have as a rule more experience and a more reasonable viewpoint." And "I see no reason why men should not officiate if they adhere strictly to the girls' rules." Even the male and female heads of high-school athletics in one state disagreed on this issue.

Student Safety Leaders

The use of student leaders in the physical education program is a common and desirable practice. Properly selected and trained, these leaders can serve an extremely important role in the safety education program. Research by Lloyd, Deaver, and Eastwood indicates that their use is valuable in accident prevention at all levels, especially in the high school, where they are also responsible for a decrease in the severity of the injuries. The degree to which students can help in the reduction of accidents is in part affected by the training in safety which they have received and the degree to which they are allowed to take an active part in the teaching situation, preferably with small squads. It is therefore recommended that the department have a *plan for selecting and training student leaders* to assist in conducting the activity program. It is common practice on the secondary level to form a leaders club, the members of which can be selected by the students, by the faculty, or by the club members themselves. Many instructors feel that it is more democratic and effective to give every member of the class an opportunity to serve in the capacity of leader. It can be readily seen, however, that the former method would ordinarily provide

safer leadership, because the fewer numbers would be easier to train more thoroughly.

The National Safety Council suggests two criteria for the selection of these leaders:

1. The experience should be an educative one which the particular pupil needs.

2. The pupil should be capable of assuming the responsibilities of a safety leader.

Superior Coach Corporation

FIG. 15. SAFE TRANSPORTATION

A good school bus, like this one of Central High School in Lima, Ohio, manned by a competent driver, provides the safest method of transporting athletic teams on highways. Private automobiles are the most hazardous means of transportation!

Parents' Consent for Participation

All *students below college level* should present their parents' *written consent for participation* in each sport of the interschool program. Although such consent has no legal significance, this procedure has become common practice, because it

is a method of informing the parents of the student's activity. It can be considered a safety measure, because a parent may be cognizant of certain weaknesses or family responsibilities because of which the son or daughter should not participate. Opinion is divided with regard to the use of such permits for intramural competition. Among the coaches and teachers polled by the writer, 60 per cent felt that permits were desirable, and the remainder felt that they were unnecessary. If intramural contests are conducted after school, it seems reasonable that these permits would be just as important as a safety factor as they would be for interschool competition.

SCHOOL FIELD TRIP PERMISSION

Name ..... Grade ..... Date .....
Destination .....
Method of Transportation (if any): .....
Name of Driver .....
Time of Leaving ..... Returning .....
I hereby grant my son / daughter permission to accompany the school class on this trip.

(*signed*) .....
Parent or Guardian

FIG. 16. SCHOOL FIELD TRIP PERMISSION FORM

Hiking and Outing Trips. If hiking and outing trips are sponsored as an activity of the physical education program, the laws governing liability enumerated apply. It is recommended, however, that parental consent in writing be obtained. The value of such a permission slip is that it shows that the parents had a knowledge of the activity and were willing that their child should participate. The permission does not, however, excuse actionable negligence on the part of the teacher.

Safe Transportation of Team Members. With the ever-increasing rise of traffic accidents [21] the problem of transporting athletic teams safely has become extremely difficult. A school should *never* allow team members to be transported in a private

[21] School-age persons (15–24 yrs.) now experience the second highest motor-vehicle death rate, only the 65 year and over age group exceeds it. Table on next page indicates the death rates.

automobile with a fellow student driving, and it is questionable whether they should be so transported even with an adult driving. This precaution should be applied to transportation to and from practice fields as well as to other communities. Some school officials even require an adult to accompany each car of student *spectators* when traveling to games away from home. Schools forced to allow transportation in private cars should be certain of the following points:

1. That the driver is a careful, accident-free, licensed operator,
2. that the automobile is an all-steel body sedan and has been currently inspected and approved,
3. that only the number of passengers prescribed by law be allowed in each vehicle,
4. that insurance policies adequately cover the players under all circumstances.

It is recommended that contests be canceled when unusually inclement weather makes driving extremely hazardous. This precaution is particularly applicable when private cars are used and the roads are unsafe because of ice, snow, fog, or rain. Such action may also save the lives of loyal spectators who may have foolheartedly braved the dangers to see their team in action.

Team players should be transported only in insured school buses or public carriers if utmost safety is desired. Comparison between the relative safety of this type of travel and the private automobile leaves little doubt in one's mind about this choice. Even in this type of transportation, however, it must be pointed

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Traffic Death Rates per 100,000 Population

Year	*5–14 yrs.*	*15–24 yrs.*
1913	5.1	3.1
1923	14.7	13.8
1933	12.7	24.8
1943	8.9	19.8
1945	10.5	30.2

Accident Facts, National Safety Council Inc., 1946.

out that the capabilities and attitude of the driver are paramount. While they are traveling, the coach should enforce among his men the common rules and regulations governing safe conduct in the given mode of transportation. These rules and regulations are too numerous to mention here, but every coach should be on the lookout for unsafe acts on the part of his players which might lead to injury or even death. Such trips provide numerous opportunities for effective safety education, because the players are keenly interested in new and novel situations.

Safety for Spectators. *Adequate safety controls should be provided for spectators,* such as safe bleachers, police and fire protection, ushers and guards, fencing of areas, control of concession hazards, and traffic regulations. Each season one reads in the newspapers of bleachers collapsing, and several people being injured and killed, but it is human nature to think "it can't happen to us." In schools and colleges where large crowds attend the various athletic contests, administrators must take every precaution to protect the spectators. All permanent stands should be inspected by qualified engineers before the opening of the sport season. The erection of temporary bleachers should be under the supervision of a qualified person, and *the bleachers should be inspected for safety* by a competent person before each usage. This important task of erection must never be left to the hit-or-miss method of student participation. (See Chapter VII.)

Fire prevention rules and regulations must be strictly enforced during the use of indoor spectator areas. Some school gymnasiums are potential "fire traps" when they are filled with spectators. The administration should make certain that all exits are unlocked and available for use. In extremely hazardous situations it might be wise for the administration to consider the advisability of conducting fire drills occasionally.

In larger schools police protection should be provided to curb the small percentage of persons who attend games to create trouble. Traffic officers should also be provided, when necessary, to direct traffic to and from the games. The school's

safety patrols and safety leaders can be used to assist in directing pedestrian traffic and in otherwise assisting with the handling of spectators. Ushers and guards are usually necessary to restrain the spectators from getting too close to, or even wandering on to, the field of play. Proper fencing or roping off of areas is also useful in keeping the spectators and players safe.

Concession wares, particularly empty bottles, present an added hazard if they are not properly regulated. Paper cups for beverages are much safer.

Limiting the Number of Contests

The question of how many contests should be permitted among the various sports has been the subject of much discussion and investigation. Again, from the standpoint of safety, there can be little doubt that certain reasonable limitations should be made in interschool competition, because as will be noted (p. 110) the incidence of accidents is much higher at this time than during classroom instruction or intramural play. On the college level the problem is not ordinarily an issue, because the number of contests usually is limited by league officials or by the college board of control to the time available. It is felt that the college players are sufficiently developed mentally to make their own judgments and sufficiently developed physically to be well beyond the dangers of immaturity.

The high-school situation, however, presents a very troublesome question. In some states the limits for interscholastic contests are set by the state high-school athletic associations, but generally athletic leagues and local school administrators determine the number to be played. Where the decision is left to local school administrators, the pressure from overzealous fans often forces the number of contests to be increased beyond all reason. For example, one school in a Midwestern state played ninety-four basketball games during a single season. Various national organizations have gone on record regarding the maximum number of contests that should be scheduled for various sports during a season. Typical of these is the American Association for Health, Physical Education and Recreation

which, in its publication covering athletic standards for boys, recommends the following limitations for senior-high-school teams:

TABLE XIII

Recommended Number of Games for High-School Competition

Baseball	16	Soccer	14
Basketball	18	Swimming	7
Football	7	Tennis	14
Golf	16	Track	7
Ice Hockey	14	Lacrosse	9

Similar standards have not been promulgated for the junior high school or elementary schools, because it has been rather generally understood that interschool competition should not be encouraged below the high-school level. If such competition does exist, it is recommended that restrictions be adopted according to the immaturity of the students and the dangers of the sports.

Intramural Contests. In general, it is deemed necessary to limit the number of intramural contests only by the condition of the contestants, the time and facilities available, and the strenuousness of the sport. In the checklist circulated by the writer to a number of leaders in the field, they expressed the opinion that it is not advisable that participation of each individual in intramural contests should be limited to two times per week. Typical of this opinion was the comment made by a State Director, Simon A. McNeely: "This must be determined by the type of competition and condition of the contestants. I do not believe such generalization valid." This viewpoint is valid in light of the low accident incidence of intramurals as found by Lloyd and Eastwood's studies reproduced in Table XIV.

Limiting Practice Periods

Closely allied with the limitation of the number of contests scheduled is the question of controlling practice periods. As would be expected, a greater percentage of injuries occur on the

TABLE XIV

Physical Education Accidents by Type of Period and Season[22]

TYPE OF PERIOD	COLLEGE						HIGH SCHOOL		
	WOMEN			MEN					
	Per cent	*Incidence*	*Severity Index*	*Per cent*	*Incidence*	*Severity Index*	*Per cent*	*Incidence*	*Severity Index*
Class Instruction	55.4	2.2	4.1	24.1	.7	.8	49	6.4	4.1
Intramural	19.6	1.7	2.8	5.1	.2	1.5	10	.98	8.5
Intercollegiate Games	5.8	20.9	2.7	19.7	7.4	1.8	43	94.0	6.5
Intercollegiate Practice	4.6	8.1	3.9	26.2	5.0	2.1			
Unsupervised (Free Play)	3.9		2.2	7.8		1.2	1	.88	5.5
SEASON									
Fall	48.3	.7	3.2	26.4	1.3	1.5	No Data		
Winter	31.1	2.8	3.6	41.5	2.0	1.9			
Spring	18.5	1.5	3.5	25.3	1.0	.9			

[22] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 196.

college level in practice than during intercollegiate competition because so much more time is spent in practice. It is surprising to learn that the severity index of injuries received at this time is higher than for those received during contests. Such a record, however, should probably be ascribed to the intensity of the practice rather than to the length of the periods, because most college practice periods are governed by League or Association rules.

Here, again, the high-school situation is the one that calls for special controls. According to the American Association for Health, Physical Education and Recreation, there are two definite reasons for limiting practice: to safeguard the time and health of the student, and to make for fair and friendly competition among teams playing in the same league or the same section of the country. It further suggests that practice be limited in three ways: to the date practice begins, to the number of hours per day, and to the number of times per week.

Pre-season Practice. The length of time required to condition the members of a team for the competitive season varies somewhat with the sport. Coaches in general feel that it takes approximately three weeks to condition a team, and this period of time has served as a guide for most pre-season practice periods. The Wisconsin Interscholastic Athletic Association requires sixteen practice days before the opening of the football schedule and a full month of training for boxing, and it sets dates before which the remaining sports cannot be started. Alabama requires at least two weeks' practice for all sports before the opening game. Other states range between these two, some setting no limitations. (See accompanying charts.)

Length of Daily Practice. The length of the daily practice session depends upon a large variety of factors, and very few, if any, state high-school athletic associations have seen fit to govern this phase of athletics. A small number of intercollegiate associations have found it necessary to limit the practice sessions of football in particular. The Western Conference, for example, has limited football practice to two hours.

Because of the important role played by fatigue in causing

A SURVEY OF HIGH SCHOOL BASKETBALL PRACTICE AND PLAYING SEASONS *

State	Open Practice	Open Play	Games Per Week	Games Per Season	Close Season	Number of Tournaments
ALABAMA	No rule	After 2 wks. pract.	Not more than 2	No limit	With st. tourn.	No rule
ARIZONA	No rule	No rule	No rule	No limit	No rule	Two
ARKANSAS	No rule	No rule	No rule	No limit	Second Sat. in Mar.	No rule
CALIFORNIA	Jan. 1	Jan. 15	No rule	No limit	Mar. 1	Seldom have any
COLORADO	No rule	No rule	No rule	No limit	Mar. 15	No rule
CONNECTICUT	Nov. 15	No rule	No rule	No limit	Apr. 1	One
DELAWARE	Dec.	Jan. 1	Not more than 2	No limit	Around Mar. 1	None
FLORIDA	No rule	Jan. 1	No rule	20	With st. tourn.	Three
GEORGIA	No rule	No rule	Two except tournament	30	No rule	One besides dist.
IDAHO	Dec. 1	No rule	No rule	No limit	Mar. 25	No rule
ILLINOIS	No rule	No rule	No rule	No limit	With st. tourn. or Mar. 20	No rule
INDIANA	First day of school	Nov. 1, if after ten days practice	No rule	18	With st. tourn.	Two besides st. if 1 counts in 18 games
IOWA	Aug. 24	After Aug. 24	Two	No limit	With st. tourn.	Dist., st., co., sect.

Scholastic Coach

FIG. 17A. SURVEY OF BASKETBALL SEASON REGULATIONS

* *Scholastic Coach*, by Charles Jurgensmeier, University of West Virginia.

A Survey of High School Basketball Practice and Playing Seasons *(Cont'd.)*

State	*Open Practice*	*Open Play*	*Games Per Week*	*Games Per Season*	*Close Season*	*Number of Tournaments*
KANSAS	No rule	No rule	No rule	No limit	With tourn.	No rule
KENTUCKY	No rule	No rule	No rule	No limit	No rule	No rule
LOUISIANA	No rule	No rule	No rule	No limit	No rule	No rule
MAINE	No rule	No rule	No rule	No limit	No rule	No rule
MICHIGAN	No rule	Thanksg. week or Nov. 15 if play football	Two	14 if play football, 17 if not	With st. tourn.	No rule
MINNESOTA	No rule	No rule	No rule	No limit	With st. tourn.	Dist., reg., st.
MISSISSIPPI	No rule	No rule	No rule	No limit	Not later than Mar. 15	No rule
MISSOURI	No rule	No rule	No rule	16	No rule	Five
MONTANA	After close of football	Jan. 4	Two	No limit	Mar. 1	Usually none
NEBRASKA	No rule	No rule	No rule	No limit	Ten days after st. tourn.	No rule
NEVADA	Dec. 1	Dec. 15	Two	No limit	Mar. 15	Three dist., one st.
NEW HAMPSHIRE	No rule	No rule	No rule	No limit	No rule	One
NEW JERSEY	No rule	Dec. 1	No rule	No limit	Apr. 1	No rule
NEW MEXICO	No rule	No rule	No rule	No limit	No rule	One besides dist. and st.

A Survey of High School Basketball Practice and Playing Seasons *(Cont'd.)*

State	*Open Practice*	*Open Play*	*Games Per Week*	*Games Per Season*	*Close Season*	*Number of Tournaments*
NEW YORK	Nov. 1	After two weeks practice	No rule	18	Apr. 1	No rule
NORTH DAKOTA	No rule	About Thanksg.	No rule	No limit	Second or third week Mar.	No rule
OHIO	No rule	No rule	No rule	No limit	With st. tourn.	No rule
OKLAHOMA	No rule	No rule	No rule	No limit	With st. tourn.	No rule
OREGON	First Mon. after last Sat. in Nov.	First Mon. after last Sat. in Nov.	No rule	No limit	With st. tourn.	No rule
PENNSYLVANIA	No rule	No rule	No rule	No limit	No rule	No rule
RHODE ISLAND	Three weeks after football	About Jan. 1	Two	20	About Mar. 1	St.
SOUTH DAKOTA	No rule	No rule	No rule	No limit	With st. tourn.	No rule
TEXAS	No rule	No rule	No rule	No limit	With st. tourn.	Three invit., dist., st.
VIRGINIA	No rule	No rule	No rule	20	With st. tourn.	No rule
WASHINGTON	After first Sat. after Thanksg.	No rule	No rule	No limit	With st. tourn.	No rule
WEST VIRGINIA	No rule	Dec. 1	No rule	20	With st. tourn.	No rule
WISCONSIN	Oct. 15	Nov. 1	No rule	18	Last day of st. tourn.	No rule
WYOMING	Dec. 15	After Dec. 15	Three	24	Mar. 20	Two

HIGH SCHOOL FOOTBALL PRACTICE AND PLAYING SEASON REGULATIONS *

State	Spring Practice	Fall Practice	Open Play	No. Games	Close Season	Post Season Games
ALABAMA	3 weeks in row	Sept. 1	2 weeks after practice	9	Sat. after last Thurs. in Nov.	None
ARKANSAS	Mon. before state tourney or, if entered, Mon. after	Sept. 1	After Sept. 1	No limit	Sat. after last Thurs. in Nov.	None
ARIZONA	Yes, but no date	Sept. 1 unless school opens before	Any time after school opens	No limit	Close of schedule	None
CALIFORNIA	No rule	Opening of school	After 15 days practice	No limit	Xmas vacat.	None
COLORADO	3 weeks	Sept. 1	After Sept. 1	No limit	First Sat. in Dec.	None
CONNECTICUT	No rule	No rule	Sept. 10	No limit	Dec. 2	No rule
DELAWARE	None	First day of school	Any time after school opens	No limit	No rule	None
FLORIDA	Yes, but no date	Sept. 1	After Sept. 1	10	Xmas Day	None
GEORGIA	No rule	No rule	No rule	1 per week	No rule	No rule
IDAHO	None	Sept. 1	After Sept. 1	No limit	Dec. 1	No rule
ILLINOIS	Any time school in session	Any time school in session	3 weeks after practice	No limit	First Sat. in Dec.	None

Scholastic Coach

FIG. 17B. SURVEY OF FOOTBALL SEASON REGULATIONS

* *Scholastic Coach*, by Charles Jurgensmeier, University of West Virginia.

HIGH SCHOOL FOOTBALL PRACTICE AND PLAYING SEASON REGULATIONS *(Cont'd.)*

State	*Spring Practice*	*Fall Practice*	*Open Play*	*No. Games*	*Close Season*	*Post Season Games*
INDIANA	No limit	Aug. 20	Any time after 10 days	10	Nov. 30	None
IOWA	None	Aug. 24	After 3 weeks practice	No rule	Dec. 1	None
KANSAS	None	Sept. 1	After 3 weeks practice	10	Sat. after Thanksg.	None
KENTUCKY	No rule	No rule	No rule	No limit	No rule	No rule
LOUISIANA	No rule	No rule	No rule	At least 4	No rule	No rule
MAINE	No rule	No rule	No rule	No limit	No rule	No rule
MICHIGAN	None	Sept. 1; Upper Peninsula, third Mon. in Aug.	After 3 weeks practice	9	Mon. after last Thurs. in Nov.	None
MINNESOTA	Yes, but no date	Aug. 25	After Aug. 25	No limit	Nov. 11	None
MISSISSIPPI	5 weeks	No rule	No rule	No limit	No rule	No rule
MISSOURI	None	Sept. 1	After 3 weeks practice	10	Last of Nov.	None
MONTANA	None	Opening of school		One per week, 7–9	About Nov. 11	None
NEBRASKA	No rule	Aug. 25	Third Fri. in Sept.	No limit	Sat. after Thanksg.	No rule
NEVADA	3–4 weeks	Not before Sept.	No rule	7–8	Thanksg.	When state title involved
NEW HAMPSHIRE	Yes, but no date	No rule	No rule	No limit	Dec. 1	No rule
NEW JERSEY	None	Sept. 1	After Sept. 1	No limit	Dec. 1	No rule

HIGH SCHOOL FOOTBALL PRACTICE AND PLAYING SEASON REGULATIONS *(Cont'd.)*

State	*Spring Practice*	*Fall Practice*	*Open Play*	*No. Games*	*Close Season*	*Post Season Games*
NEW MEXICO	No rule	Aug. 25	After Aug. 25	No limit	Nov. 30	None
NEW YORK	None	Sept. 1	After 3 weeks practice	8	Dec. 1	No rule
NORTH DAKOTA	None	Sept. 1	After Sept. 1	No limit	Armist. Day	No rule
OHIO	4 consecutive weeks	If no spring practice, Aug. 20	Sept. 17	No limit	Nov. 28	None
OKLAHOMA	Any time between close of fall games and end of school	Sept. 1	After 3 weeks practice	No limit	Sat. after Thanksg.	None
OREGON	None	Sept. 1	After Sept. 1	No limit	Last Sat. in Nov.	None
PENNSYLVANIA	None	Aug. 24	After Aug. 24	No limit	No rule	No rule
RHODE ISLAND	No rule	2 weeks before school opens	Oct. 1	7–9	Thanksg.	None
SOUTH DAKOTA	None	Not before Aug. 24	No rule	No rule	No rule	No rule
TEXAS	None after Feb. 1	Sept. 1	After Sept. 1	10	Last Thurs. in Nov.	None
VIRGINIA	None	A class, Sept. 1; B class, Aug. 24	No rule	10	Sat. after last Thurs. in Nov.	No rule
WASHINGTON	None	Sept. 1	After Sept. 1	No rule	Sat. after Thanksg.	By special permission
WEST VIRGINIA	None	Aug. 25	After 15 days practice	No rule	Sat. after Thanksg.	When approved by Bd. of Appeal
WISCONSIN	None	Sept. 1	After 16 days practice	8	Before Dec. 1	None
WYOMING	No rule	No rule	Second week of school	8–10	Nov. 11	None

accidents and injury, the writer interrogated leaders in the field on this point. They agreed generally that as a safety measure against fatigue, practice sessions in high-school sports should be limited for each individual to an hour and a half. It should be noted that this limitation is for each individual, and not for the total length of the practice period. The American Association for Health, Physical Education and Recreation Committee on Interscholastic Athletic Standards for Boys recommends that football and basketball *practice periods* be limited to this length of time.

Number of Practice Periods per Week. The number of practice periods per week is usually left entirely to the judgment of the coach, but is limited by the facilities available in some schools. The modern tendency seems to be away from too much practice, especially in those sports that require more speed and dexterity than strength and endurance.

Class Periods and Intramurals. Most of the foregoing observations apply to interschool competition, but it is apropos to consider the length of practice periods in physical education classes and in intramurals. Classes are usually limited to the length of the regular school periods, and ordinarily are considered too short. Those schools that find the double gym period better suited to instructional needs must avoid undue fatigue on the part of the students, for it might result in a higher accident incidence. There seems to be no particular class period during the day when the accident incidence is higher than normal.

Sufficient time for showering, dressing, and getting to the next class must be allowed. When students are forced to rush to and from showers, dress hurriedly, and rush to the next class, it increases the possibility of accidents. Although most school physical education periods are too short for the usual class activities, it is not wise economy to "rob" the students of needed minutes for dressing. Table XV, which indicates the time allotment advocated by the University of the State of New York, the New York State Education Department, is recommended as a basis for scheduling:

TABLE XV

General Time Allotment for Instructional Period [23]

Class as a Whole		*Class in Squads or in Special Formation*	*Class as a Whole*
10 to 12 per cent of the period	4 to 6 per cent of the period	60 to 75 per cent of the period	12 to 20 per cent of the period
Dressing for class	Assembly Preliminaries Warming-up and body building activities	Instruction, practice, and evaluation of activities adapted to the needs of each group. Rotation of squads.	Reassembly Showers Dismissal

The usual complaint regarding intramurals is that students are not properly conditioned before participation. The high severity index on the high-school level would bear out this assumption. *It is therefore recommended that sufficient time be spent in conditioning before participation in intramural sports.* Three weeks of training is the usual recommended minimum for most sports.

First Aid and Handling of Accident Cases

General Administration. Every school, regardless of size or level of education, should have a definite policy for the handling of student accidents. All members of the health and physical education staff and all grade teachers of this subject should be thoroughly informed of this procedure and properly qualified to render first aid. It is advisable, especially below college level, to have the names, addresses, and telephone numbers of the parents and the family physician of each student in accessible files. First aid is defined by the American Red Cross as "the immediate, temporary treatment given in case of acci-

[23] Physical Education Syllabus, Book IV, University of the State of New York.. New York State Education Department.

dent or sudden illness, before the services of a physician can be secured."

Acme Photos

FIG. 18. UNSAFE WAY TO CARRY AN INJURED PLAYER

Further damage often results from carrying an injured played in this manner. A stretcher should *always* be used.

The National Safety Council recommends that the administration make definite arrangements with a nearby hospital or clinic to handle emergency cases when the family or school physician is not available. If, after notification, the parents want their child to have medical attention at some place other than the designated hospital, the parents should assume responsibility for this procedure. In the case of a moderate injury, if the parent is reached before the student is sent to a doctor, the student should be taken wherever the parent directs. (The college

situation presents different administrative procedures which are usually well established and functioning.)

A first-aid room should be provided with adequate equipment, including a stretcher, and made available to all activity areas. Making such equipment available to all areas of activity may present quite a problem, but every effort should be made to do so. Often the playing field is some distance from the first-aid equipment, and if a telephone call is necessary, valuable time is lost before aid can be secured. Specific mention is made of a stretcher, because this valuable piece of equipment is usually not included, and it should be by all means. The stigma which once accompanied its use is rapidly disappearing, especially at football games, where one should always be available. Dr. George G. Deaver, famous New York University orthopedist, sees its use as an educational device as well as the only sensible means of transporting the injured. He says,

> When one observes the methods used by many schools and colleges in transporting injured players to the sidelines, there can be no doubt that many simple injuries are aggravated by the rough treatment. If schools and colleges used proper methods of transporting injured football players, instead of pulling them off the field with head, arms, and legs dragging, it would be an excellent method of educating the spectators on the proper treatment of injury.[24]

Administering treatment at the scene of the accident, especially to serious injuries, upsets class or team morale and should not be practiced unless absolutely necessary. Also, the injured person ordinarily prefers privacy, and the person administering first aid should have a suitable place to work.

Available First Aid. It is apparent that much of the severity of injuries is due to lack of adequate and immediate treatment. College statistics indicate that the two best procedures for rendering first aid are the use of, first, the medical doctor, and second, the teacher of physical education. In high schools using the teacher of physical education for this service

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[24] George G. Deaver, "First Aid Emergencies," *Journal of Health and Physical Education,* April, 1941, p. 233.

there is a lower average severity incidence than in schools using other teachers or the principal. It is desirable to have medical service available for all types of periods, class instruction, intramurals, and interschool competition.

A physician should be present at all combat sport interschool contests. It will be noted that this principle is applied specifically to *combat* sport *interschool* contests. It is usually possible to have a physician present, and certainly it is a most desirable practice. If it is not possible, he should at least be within calling distance. The sports for which such service is desirable are usually considered to be football, boxing, lacrosse, horse polo, and ice hockey and possibly wrestling, field hockey, basketball, and gymnastic matches. A physician, trainer, nurse, or competent first aider should be present for combat sports practice. Usually the coach is competent first aider, which fulfills this requirement. Some coaches do not feel themselves sufficiently qualified, and therefore like to have a more competent person present, or at least available. A physician, trainer, nurse, or competent first aider should be available for all class and intramural activities. If the instructor is a qualified first aider, as has been recommended, his presence should suffice. In fact, it is customary in most schools where a nurse or physician is not employed for the Department of Physical Education to act in all school first-aid cases. However, a doctor should always be available, and it is recommended that the names and telephone numbers of approved physicians be on file for emergencies. (In case the injured person does not express a desire to have his family physician, this is useful.) "The availability of a medical doctor for class instruction results in an average reduction of severity of the injuries of two thirds, in intramurals of approximately 36 per cent and for intermurals of approximately 40 per cent." [25]

Recommended Procedure in Administering First Aid. School organization and the conditions under which accidents occur vary so much that it is difficult to establish first-aid pro-

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[25] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 203.

cedures which cover all cases. The following steps, therefore, are given to serve as guiding principles.

First Step

The nearest qualified first aider should act in case of injury. If the first aider happens to be one of the students, the coach or teacher should take over as soon as he or she arrives.

a. He should determine the location, nature, and seriousness of the injury. The first aider will have to call upon his knowledge and experience to make this preliminary decision.

Second Step

He should then determine the proper course of action.

a. If the injury is minor, he should give first-aid treatment and then refer the decision with regard to further treatment to parents or school nurse.

b. If the injured person can walk or be carried safely to the first-aid room, he should be taken there. This applies particularly if the injured person is in such condition as to alarm others. The first-aid room is a more suitable place for treatment.

Third Step

If injury is serious, the following steps should be carried out: *Telephone or send a dependable messenger to notify the school physician, nurse, or trainer, as well as the principal.*

a. Instruct him to tell the location of the injured person and the nature, cause, and probable extent of injuries.

b. Instruct him to tell what first aid has been given and ask what to do until one of the above-mentioned persons arrives.

Fourth Step

Continue first-aid treatment in accordance with Red Cross recommendations and school policy until the physician, nurse, trainer, or principal takes over. In most serious cases experienced in the physical education program, it is advisable to

make the patient as comfortable as possible and await the arrival of a physician. It often becomes the first aider's role to protect the injured player from the excited and foolish actions of would-be helpers.

FIFTH STEP

The physician, nurse, trainer, teacher, or administrator should determine the seriousness of the case, decide whether an ambulance should be called and/or the parents notified and their disposition of the case requested, and act accordingly. Some instructors feel that only a physician should make this decision, which is probably true in metropolitan areas, but in rural areas it might be necessary for one of the others to make this vital decision. The utmost tact must be used in contacting the parents, and the principal probably should handle this task.

SIXTH STEP

Transportation to the home should be provided by the parent or by the administrator at the parent's request. A doctor, nurse, or a person designated for the purpose should accompany the injured, if necessary. Some schools may find this procedure unsatisfactory, but practice has shown this to be most desirable. Captain Fred C. Mills, Director of Health and Safety, Boy Scouts of America, has this to say:

> Of all things related to care of the injured by lay persons, this matter of transportation is perhaps the most serious. I doubt that if the injury is serious the person should be transported without specific instructions from a physician, unless weather conditions make movement absolutely necessary to prevent further harm being done. The question of whether the patient will be transported by parents or otherwise is also a matter to be decided by a physician.

The Follow-Up. *Investigation of the cause of the accident should be made immediately.* It should include the injured person's version and witnesses' testimony. The teacher in charge should have taken the precaution to insure that the apparatus or facility involved in the accident is maintained in

status quo until the inspection has been made. It is understandable, of course, that often no facilities are involved, or that it is not possible to retain them in *status quo* or to investigate immediately, but every effort should be made to do so. In such an investigation the instructor should seek the true cause of the accident, which lies deeper than the unsafe act or the physical hazard. Then, by examining the health record of the student, it may be possible to determine the true cause and prescribe intelligent corrective measures. "This task of knowing each pupil's needs will, under any system, be greatly simplified by a strong system of diagnosis and cumulative records (including accident reports and items from anecdotal behavior journals). Faculty cooperation on the problems of particular students will be helpful." [26]

As soon as possible, *a written report,* on a standard form, of all injuries which force the student to miss one or more physical education periods, should be made. The accompanying form is recommended. An effort has been made in this report not only to record the facts of the accident, but also to stimulate the instructor to delve into the background of the causes and prescribe intelligent methods of correction or compensation. Such elaborate investigation and study would not be necessary in all accident cases, but would be most useful in helping accident repeaters. Many large schools have a special form that is used for reporting accidents. Others use the standard National Safety Council form (see page 70), but these blanks do not usually include sufficient information for the Department of Physical Education. Many such forms are designed only to protect the school from law suits. The use of a special form for this department might be in addition to the regular school report, and could be treated confidentially. As an educational device, it is desirable to have the injured person assist in filling out the accident report. Not only should this form be filled out, but *a follow-up should be made and the factors involved in the accident corrected.* Often this may entail just the repairing of a

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[26] National Safety Council, *Safety in Physical Education and Recreation,* p. 21.

UNIVERSITY OF KENTUCKY
PHYSICAL EDUCATION DEPARTMENT
ACCIDENT REPORT

Name of injured..... (Last) (First) (Initial)
Home address ..... Phone No.....
Physician who cared for injured..... Phone No.....
Person who rendered first aid.....
Instructor or Coach present at the time (name).....
Who should have been present? (Fill out one).....
Date of injury..... Time of day.....
Injured in: Intramurals..... or Physical Education class .....
Sport?..... Number?.....
General description of injury.....
.....
Place accident occurred.....
What was subject doing at time of injury?.....
.....
What was the immediate cause?.....
.....
Was injured person at fault?.....
What do you consider the true and background cause? .....
.....
How many other accidents are on record for this person? .....
What is the opinion of another faculty member on the above points?.....
.....
What steps have been taken to prevent a recurrence, with respect to:
1. Unsafe condition of facilities or equipment?.....
2. Attitude of injured?.....
3. Correction and/or compensation for physical defect of injured?.....
.....
Report filed by..... Date .....
Copy of this report filed with Student Health Service ..... (Date)
Approved by ..... (Head of Department)

Pub. Nov., 1947

University of Kentucky

FIG. 19. ACCIDENT REPORT FORM

UNIVERSITY OF KENTUCKY
DEPARTMENT OF PHYSICAL EDUCATION
FIRST AID POLICIES AND PROCEDURE

An instructor must be present for every physical education class and an instructor or an official representative for all intramural contests and extra curricular activities sponsored by the Department. It is his responsibility: (1) to make certain that the facilities and protective equipment are adequate and in repair; (2) to ascertain the immediate fitness of the individuals to participate; (3) to teach progressive skills, and; (4) to insure that the rules and regulations of the activity or contest are properly enforced.

An injury shall be considered any contusion, cut, abrasion, sprain, strain or fracture, that makes it advisable or necessary for the participant to retire from play, to receive first aid treatment, or prevents him from attending the next class meeting or intramural contest. Cases of sudden illness shall be similarly administered.

PROCEDURE

FIRST STEP—**The nearest qualified first aider should act in case of injury.** If this person happens to be one of the students, the coach or instructor should take over as soon as he or she arrives. **He should determine the location, nature, and seriousness of the injury.** The first aider will have to call upon his knowledge and experience to make this preliminary "diagnosis".

SECOND STEP—**He should then determine the proper course of action.** If the injury is minor, treat, then refer to Student Health Service the decision with regard to further treatment. If injured can walk or be carried safely to the training room or first aid room, take him there. This applies particularly when the injured person is in such condition as to alarm others. The first aid room is a more suitable place for treatment.

THIRD STEP—If injury is serious, the following steps should be carried out: **Telephone or send a dependable messenger to notify the school physician or trainer.** Tell the location of the injured person and the nature, cause, and probable extent of injuries. Tell what first aid has been given and ask what to do until one of the above-mentioned persons arrives.

FOURTH STEP—**Continue first aid treatment in accordance with Red Cross recommendations and school policy until physician or trainer takes over.** In the majority of cases experienced in the physical education program, it is advisable to make the patient as comfortable as possible and await the arrival of a physician. It often becomes the first aider's role to protect the injured player from the excited and foolish actions of would-be-helpers.

FIFTH STEP—Physician, trainer, teacher or administrator should determine the seriousness of the case, decide whether an ambulance should be called or the patient transported on a stretcher or in a car to the Student Health Service or hospital. In most cases, only a physician should make this decision. Transportation to the home should be provided by the Department only upon the recommendation of the physician.

SIXTH STEP—When the injury is serious enough to warrant, the Dean of Men or Women, or person designated by them, will notify the parents of the individual. The appropriate dean will be informed by the Department of Health and Hygiene.

FINAL STEP—**The instructor in charge must fill out the accident report blank, on reverse side, and file a copy with the Student Health Service and the Department of Physical Education.**

University of Kentucky

(reverse)

FIG. 19. ACCIDENT REPORT FORM

board or re-emphasis upon some safe practice, but necessarily a number of serious results will warrant a major reconstruction job or improved teaching techniques.

Hospitalization of the Injured. For many years it has been customary for colleges to offer health service plans, usually covering limited periods of hospitalization, to all students upon payment of a relatively small fee. Members of physical education classes and athletic teams are usually covered in case of accident by these health service plans. High schools have been slow to recognize their responsibilities in this regard. In many communities local physicians have provided free service for injured players, or the school has arranged to pay nominal fees for the service. The most satisfactory method to date appears to be the state or private insurance company athletic benefit plan, in which the player pays a small fee for "insurance," or the athletic association finances the participation for all players. Because of the hardship which the cost of medical care or insurance often places upon the families of those unable to afford the expense, *the benefits of an athletic benefit plan should be provided for all members of interschool teams.*

Probably a stronger case could be made out for the provision of such services for *all* students. Some persons reason that their children are compelled to attend school and to engage in dangerous physical education activities, and, therefore, when the children are injured in those activities, it becomes the school's responsibility to pay for the resulting medical care. Therefore, the present trend seems to be to make the benefits of an athletic benefit plan available to *all* students who wish to subscribe. Wisconsin has been a leader in this movement. Some states, such as Wisconsin and Illinois, have extended the plan to include elementary-school children.

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FIG. 20. LEADERSHIP OF THE HIGHEST QUALITY

Amos Alonzo Stagg, 85, dean of American coaches says, "I believe good leadership is the most important factor in safety in athletics. Good coaches usually have fewer injuries amongst their players because they are considerate and teach good sportsmanship."

VI

SAFETY THROUGH LEADERSHIP

Leadership Controls

LEADERSHIP IS PROBABLY the most important of the safety controls. With good leadership even poor administration and inadequate facilities can be overcome, and a fine record for the safe conduct of sports can be established. The qualities and training necessary among coaches and instructors to insure a high type of leadership have been discussed earlier, but it might be well to point out again that teachers and coaches must become *safety-conscious*. Such a vital factor should not be a hit-or-miss policy of department conduct. To determine leadership failure, the attitude and methods used by every instructor and coach should be studied and the accident statistics analyzed from season to season.

Sources of Leadership Controls. There are three main sources of leadership controls: the instructor or coach, the official, and the player. All are important but vary in influence. Lloyd and Eastwood contend that 31 per cent of all accidents and 30 per cent of the days lost are caused by improper leadership controls, and that of these accidents 44 per cent are due to inadequate officiating, 40 per cent due to improper supervision during the activity, and the remaining 13 per cent to inadequate conditioning of students. Breaking these statistics down further, they reported that 13 per cent of high-school accidents were due to poor conditioning; among college women approximately 56 per cent were due to poor leadership, including lack of training, old injuries, fatigue, and overtraining; and among college men approximately 46 per cent were due to lack

of training, fatigue, and old injuries. "It is evident that those responsible for the safety controls are not giving sufficient attention to conditioning of the body or training in the skills required for the activity." [1]

The Coach's Responsibility. Every coach has a stake in the safety and well-being of his men. If a player is hurt, his efficiency is impaired, and the team suffers accordingly. The more players injured, the less successful is the team. Many athletic coaches, therefore, have become specialists in the field of safety. They devote many hours to the careful instruction of their players in the various fundamental skills of the sport and in giving "tips" that will add protection in executing these skills. The more of these safety tips the coach knows and succeeds in putting across to his men, the fewer injuries there will be to mar the team's performance. Too often, however, this concern is overshadowed by the desire to win. *A coach should always place the safety and welfare of his men above the desire to win.* "Coaching for the sake of the game and with the purpose of winning at all costs, rather than for the sake of the player, will result in undesirable educational and safety results." [2] The writer has suggested three general principles which, if followed, should result not only in fewer accidents but also in a much healthier athletic situation.

1. The community, largely through the attitude of the coach and the school's administrators, should be taught not to be too demanding of the school's athletic teams.
2. The coach's concern should be focused primarily upon the health and safety of the players under his direction.
3. The school board should furnish sufficient funds for protective equipment, safe playing fields, safe bleachers, and suitable transportation, so that the teams will not be forced to depend on the "gate" for these facilities and services.

The Instructor's Concern. Similarly, the instructor of physical education is vitally concerned with the safe conduct

[1] *Safety in Athletics*, p. 211.
[2] *Ibid.*, p. 191.

of his classes and intramural sports. Often, of course, the athletic coach and the instructor of physical education is the same person, serving in both capacities. Fundamentally, the obligations and approaches to the problems are the same for both. The physical education instructor, however, is more often forced to conduct sports and other activities for which adequate protective equipment and sufficient space are not provided. The participants are less skilled and less fit than those reporting for athletics. His problem, therefore, is often more difficult even though there is not the pressure to produce winning school teams.

Method in Accident Prevention

The method of instruction and organization is basic in the control of accidents and injury in physical education. The efficient coach or instructor who has good organization and uses good teaching techniques will have better control of his squads and classes, and fewer accidents and injuries will result. When participants are kept busy learning the proper skills and playing according to the rules of the game they are less likely to experience accidents and injury through forbidden stunts and horseplay. Staley comments upon this point.

> A class that is conducted efficiently is so busy performing necessary and worth-while activities that there is little or no opportunity for 'cutting capers.' Disorder arises when interest and action begin to lag, or when confusion exists. The instructor who assumes a negative approach is defeating his own end. He is so concerned about disorder, so on the alert for it, so ready to squash it, that he is prone to neglect the very thing which is the best check against it —efficient management and direction. He would do much better if he centered his attention on teaching and learning procedures, and then handled disorder when it arose.[3]

In handling large groups the coach or instructor must be wide awake and assume comprehensive control if accidents are

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[3] Seward C. Staley, *Sports Education*. New York: A. S. Barnes & Co., 1939, p. 240.

to be avoided. He must not become intensely absorbed in one or two individuals while the remainder of the group runs wild; nor can he afford to loaf on the job. The handling of large numbers, especially in combat sports, is a difficult task that must be undertaken with a knowledge of the proper methods of accident prevention as well as the best procedures of organization and instruction. It is not within the province of this text to discuss the various methods of instruction, and the reader is referred to the many good texts on this subject.

Equally Matched Teams and Contestants. It is obvious that matching of teams or contestants of unequal strength, size, age, or ability is to court unwarranted danger. Since at least 50 per cent of the causes of accidents are due to the nature of the game and hence are probably unavoidable, the important role played by fair competition is to be emphasized. The practice of small schools with comparatively weak teams scheduling larger ones because of financial returns is to be frowned upon. Also the matching of individuals in such sports as boxing or wrestling who are entirely out of each other's "class" is not to be condoned. If, by chance, such uneven matching occurs, a good official or a conscientious coach will stop matches before the weaker fellow gets hurt.

It is therefore recommended that, *in contact sports, contestants and teams be as equally matched as possible.* This matching is recommended for contact sports only because the chief concern here is safety. Although it may not be desirable to match tennis players or swimmers of extremely different abilities, very little harm could result from the safety viewpoint. This principle of fair competition should, of course, apply to all competition whether it is in athletics, intramurals, or in physical education classes.

Progressive Skills. *The fundamental skills of all activities should be progressively taught and thoroughly learned.* Just as the success of a team or individual depends upon the acquisition of skills, so does the safety of each individual depend to a great extent upon such mastery. Performance in good form is usually a safety factor. Athletic coaches, therefore, are

ordinarily very thorough and meticulous in the teaching of fundamental skills. On the other hand, often the athletic coach and some instructors of physical education do not take the time and energy necessary to teach thoroughly in their classes or in intramurals. This is often the situation when classes are so large that individual instruction is impossible.

Activities and teaching procedures should be so organized that the student will pass through a progression of logical skills. Particular care should be given in those skill areas where the greatest incidence or severity of accidents occur, such as sliding in baseball and blocking and tackling in football. Progression of players from physical education classes and intramural sports to varsity squads was pointed out by Lloyd and Eastwood to be a safety factor. In speaking of this point Clark Shaughnessy, famous football coach, said, ". . . football coaches probably don't think of it as safety, but every sound coaching instruction has a double purpose: 1. The most effective execution of the maneuver; 2. protection of players involved to prevent them from being injured and thus keep them in the ball game."[4] *The use of lead-up games in teaching sports is a factor for safety.* This is true because the teaching of lead-up games is actually an advanced step in bringing together the learned fundamental skills that make the transition to the actual playing of the game less complicated and hazardous. Such lead-up games as "keep-away" in basketball, tag tackling in football, and "pepper" in baseball are interesting combinations of desirable fundamentals that help condition the players as well as teach progressive skills.

Progressive Conditioning. Preceding, and simultaneously with the proper development of fundamental skills should come progressive conditioning. Lloyd and Eastwood reported 13 per cent of high-school accidents as due to poor conditioning of the athlete. *Progressive conditioning of all participants is necessary for safe participation in all sports and activities.* Almost the same generalities are applicable here that were listed above, however, the extenuating circumstances are far more

[4] "Touchdown for Safety," *Safety Education,* October, 1943, p. 48.

numerous. Not only the player's training schedule while at school, but also his health habits throughout the remaining hours are involved. The condition in which each individual reports for the team or class and the time required to get into condition present a major teaching challenge to the coach or teacher.

Scholastic Coach

FIG. 21. SAFEGUARDING HEALTH

Regular weight checking is a health safeguard that is required by almost all coaches and physical education instructors. By this means the coach or instructor is forewarned of organic disorders and disease as well as of over- or underwork.

The normal body possesses remarkable qualities for withstanding the rigors of a physical education or varsity sports program, and its ability to recover, especially in the young and well-conditioned person, is even more astonishing. It is essen-

tial, however, that the teacher or coach work out an intelligent progressive conditioning schedule for each individual to insure all participants' being in perfect condition. Each sport, of course, requires a type of condition different from the other. The player who is in perfect condition for football is not able to step on to the basketball court and last out a full game. Nor is the basketball player in condition for track events or boxing. There is only a partial carry-over; new neuromuscular skills must be established, and the heart and lungs adjusted to the different types of endurance and power required. The coach or instructor who succeeds in bringing all participants to a maximum stage of condition in the shortest length of time with the fewest injuries and illnesses is the one most likely to be rewarded with success.

Weight Check is Health Safeguard. Coaches keep close tab on the weight fluctuations among their players so that they may help them attain fitness and to be forewarned of any organic disorder or disease as well as of overwork. Some coaches require daily checks before and after practice, and others believe a weekly check is sufficient. All agree that it is a desirable safeguard. Many instructors of physical education encourage class members to keep similar records of their weights.

Warm-up. *Participants should be thoroughly warmed-up before performing strenuously or competing.* The physiological necessity of the warm-up is well known and accepted in athletics and physical education. Each coach and instructor has pet theories about the proper method of warming-up for the various sports or activities. Some of these will be discussed in the Sport Chapters.

Stevens and Phelps make the following observations:

> The warming-up process can never be the same for all individuals, nor can it be the same in all climates or types of weather or sports. Sweating is important in the elimination of waste products, and sweating varies markedly with change of temperature.
>
> Warming up is thought of by some athletes as simple limbering up of the joints, and these men run a few steps, lifting the knees high, turn a few somersaults and present themselves as ready to be-

gin. This is not recommended. A carefully worked out system of warming-up should be developed by each athlete to fit what he has found by experience to be his particular needs. In general, this should be a gradually-increasing set of activities which should increase the heart rate, not too much at a time, until he feels himself at a peak. If carried too long, he will be likely to begin tiring and thus waste valuable energy. At the peak of warming up, a man should feel a slight beginning of sweating, provided he is warmly clothed, and should feel a definite increase in his muscular efficiency.[5]

As these physicians point out, the requirement of warming-up varies with sports, and even for events or positions within sports. A distance runner in track will usually require a lengthy and vigorous leg and body warm-up so that he will acquire his "second wind" before the race, whereas a shot-putter requires a less vigorous leg warm-up and a more vigorous arm warm-up. Track fans will recall the amazement the great Cunningham caused with his ambitious warm-ups. In fact, there are very few sports or activities that do not require a good warm-up if injury is to be avoided and if maximum efficiency is to be attained.

Pre-Game Warm-Up. The character of the pre-game warm-up depends upon those factors mentioned above, plus that elusive quality of being "keyed up." When a team has been keyed to the extreme, its members cannot be subjected to the same long and thorough group of exercises followed in practice or they will become exhausted before game time. The sagacious coach will weigh all of these factors in planning his pre-game warm-up periods. In relation to safety, there are two principles of warming-up for both practice and pre-game that are often neglected and therefore are mentioned here: first, that sufficient stretching exercises should be employed; and second, that the initial warm-up period does not guarantee a proper physiological tone indefinitely. The first precaution is particularly necessary in avoiding pulled muscles (tendons). The sec-

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[5] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps, Copyright 1933, by A. S. Barnes and Company, Inc. P. 37.

ond is mentioned because too many coaches and instructors are prone to forget how long a player sits on the bench, and send him into the fray after he has lost the benefits of the original warm-up period.

Sport Rules for Safety. Many of the rules of participation, in contact sports particularly, are designed primarily for the safety of the players. It has been found through years of experience in certain sports that the rules need to be adopted to the age level and sex of participants, because of the varying stages of organic and structural development. For this reason *all play should be under rules provided for the given sex and age level.*

When necessary, local ground rules should be established to provide protection against special hazards. Often a traditional tree or some structural hazard makes it necessary to adopt special ground rules in various sports. This is quite customary in baseball, and leaders should not hesitate to apply the same practice to other sports when safety is involved.

Good Sportsmanship a Safety Factor. Good sportsmanship by the players and by the coach or instructor is an important safety measure for the prevention of injury. The losing player who resorts to tripping, the sore head who clips an opponent, and the coach who leaves a player in the game who has "ridden" an opponent into the bleachers are all examples of poor sports who cause injuries. Although the officials can, and usually do, control such conduct, it is far better that these situations never arise. In other words, good sportsmanship practiced by the instructors and students in class and by the coaches and players on the practice field will usually insure good sportsmanship on the field of conquest.

Informed Players. To help avoid injury to others as well as to themselves, participants should know the safety implications and should observe the rules of the game. Playing according to the rules and spirit of the rules reduces injuries, and those players who know the rules are more likely to observe them. It is therefore recommended that coaches and instructors make special efforts to familiarize all participants with the

rules before participation. Progressive instructors frequently give written tests on the rules of the game being learned.

Furthermore, *participants in all physical education activities should be instructed on the facts of accident causes, incidence, parts injured, and severity.* Each sport and activity has certain inherent and attendant hazards about which participants should be informed. Players should also be cognizant of the safety role played by one's attitude and knowledge in such participation. It is the responsibility of the instructor and coach to teach these knowledges and attitudes as well as skills for safety. The imparting of such information need not take the form of rote classroom work, but might rather be interwoven with the activity instructional period. Such admonitions as "Don't forget, Bill Jones had his ankle broken doing that last year," or "Most of the injuries we've had on the parallel bars have been caused by spotters putting their arms over, instead of under, the bars" are very effective and are often employed by teachers of physical education. Such instruction need not be predominantly negative in nature, because most instructors feel that "scaring" is not good methodology. James Vaughn [6] says that unless there is ample justification for it, negative instruction in safety education should not be used. School spirit and group approbation are of immeasurable value as incentives in teaching safety education.

Squad System for Safety. When it is possible, *physical education classes should be divided into small squads, with student leaders for safer practice.* Such practice is not only a good instructional device but it also provides for greater safety because it makes supervision easier.

Use of Student Leaders. Student safety leaders should be used to assist in conducting physical education and playground activities. If properly selected and trained, student leaders may serve an extremely important role in the safety education program. Different needs and types of programs among

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[6] *Positive versus Negative Instruction.* Columbia University, Ph.D. Thesis, 1928, p. 168.

schools will make different duties for these leaders, but the following suggestions are made in an effort to cover most situations.

Safety Responsibilities of Student Leaders

1. To assist in the daily inspection of play areas, apparatus, and equipment.
2. To instruct new students in all activities, especially in the use of apparatus and facilities. (See Chapter X for further suggestions on the use of apparatus.)
3. To supervise activities and assist in their safe performance.
4. To assist in the setting up and proper use and storage of equipment and supplies.
5. To conduct groups safely from school to playground and back, particularly where it is necessary to cross traffic lanes.
6. To help develop an attitude of safety on the part of fellow students.
7. To learn the rules of the various sports and to officiate well.
8. To learn first aid and how to report accidents.[7]

Safety patrols may be used on crowded playgrounds. This practice is growing in popularity, particularly where traffic is a hazard, because of the usefulness of the patrols. The advantages of using the patrols are that they are already organized and the students have a distinguishing badge or Sam Brown belt that adds authority to their office of supervision. Unless pupils are trained to assist in the conduct of various activities, they are of little value in this respect. Class or team equipment should be delivered by managers or class leaders to the playing field and distributed for use *only* upon permission of the instructor. When such equipment as balls and bats are distributed within the gymnasium, the players in their exhilaration or anxiety to get to the field are likely to race and throw bats or balls promiscuously. Broken windows and other property

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[7] *Safety in Physical Education and Recreation*, p. 45.

damage may result as well as occasional injury caused by collisions or falls.

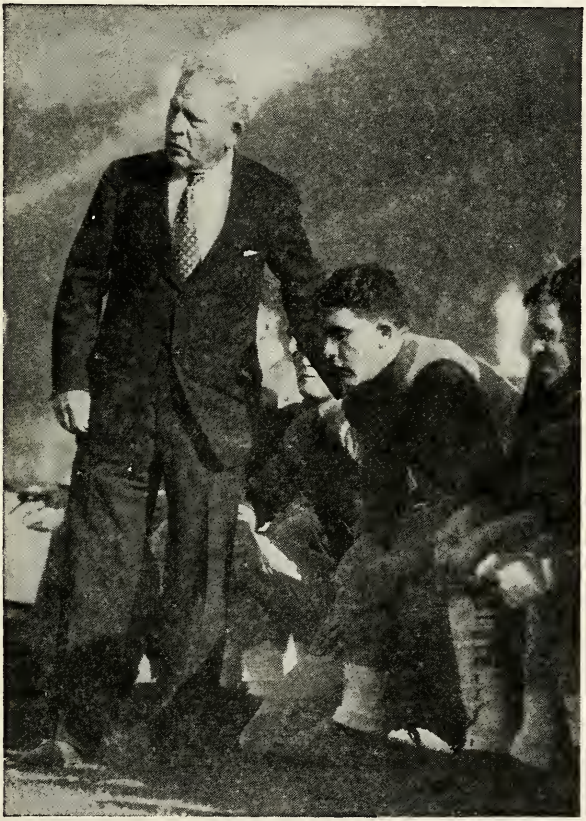
Accidents Due to Excitement or Fear

During gym shows and exhibitions, students are likely to be overstimulated and unaware of new hazards, and special precautions must be made for their safety. The situations that arise during such shows are too numerous and problematical to be discussed here. However it would seem wise to explain to the participants that they will probably be overadrenalized, which tends to stimulate a person to "go beyond endurance" and to attempt more difficult stunts than can be safely accomplished. It should also be pointed out that the noise, glamour, and confusion which accompany the usual exhibition create an artificial atmosphere, which, when combined with the average student's stage fright, may hamper his ability, particularly until he has become accustomed to the strange circumstances.

In Athletics. An inexperienced athlete usually meets these conditions during his first game, as well as before large crowds and important contests, but he soon learns to adapt himself to the situation. Most athletes say, "I was scared to death until the whistle blew, and then I forgot all about the crowd." Players, particularly in combat sports, should not be overstimulated by pep talks prior to or between halves of contests. Such "adrenalization" often boomerangs by exciting the players beyond their ability to think clearly and act intelligently and may result in an unwarranted number of injuries.

Furthermore, *a player's fear of injury may make him more liable to injury.* Although there is not, and possibly there never will be, any scientific proof of this, most instructors believe it to be true. To offset it, it is necessary that the player's confidence be built by improving skill and "losing" himself in the game. Skill is improved through constant and intelligent practice, and the wise coach leads the timid player progressively through a series of "fear situations" until he learns to conquer his fear of such daring stunts as tackling, doing a backward dive, or a giant swing.

In Class. Likewise, *the teacher should be quick to restrain the overstimulated student when his actions might lead to injury.* It is not unusual for participants in the physical education program, especially children in the lower grades, to become highly emotionalized and hence dangerous to others as well as to themselves. Such conduct is less rare but not unknown on the higher levels, even in college, where players may "lose their heads." The teacher or coach must be able to rec-



Acme Photos

FIG. 22. PROPER SUBSTITUTION PREVENTS INJURY

Clever substitution wins games but proper substitution prevents injuries. The removal of fatigued players to prevent injuries is paramount in all good coaches' schemes of substitution. Coach Alonzo Stagg is sending in a substitute player here.

ognize these persons quickly and to restrain or withdraw them from the activity or contest. Then, to try to correct the tendency would be a worthy goal.

The Teacher Should Not Coerce. The obese, the weak, or the uncoordinated pupil should not be chided or coerced into attempting skills or stunts beyond his ability. In those schools where these handicapped persons are members of the regular classes, the instructor must be cognizant of the fact that each person has a physiological limit and not prod him too far. This does not mean, necessarily, that such pupils should not be encouraged to extend and to go beyond what they usually feel possible. It means rather, that the instructor must use good judgment in handling them. Controlling the attitude and conduct of other pupils toward these unfortunate ones may also be necessary.

There are also activities which are too difficult and hazardous for certain pupils. According to Lloyd and Eastwood,

> Participation in the very hazardous activities should not necessarily be required of all students in class instruction. This is particularly true in heavy apparatus activities. The high incidence of severe accidents found in high school, where it is often required of all in class instruction, and the comparatively small incidence of accidents in this activity in colleges, where the organization is usually in small interest groups, is evidence for this principle.[8]

Staleness and Fatigue in Relation to Safety

The coach and instructor should realize that staleness and fatigue often lead to injury. They should be able to recognize the signs and not utilize certain players or remove them from the game at the proper time. Many accidental injuries in physical education and athletics are due to fatigue and overtraining. It behooves every coach and physical educator to become adept not only in preventing staleness and fatigue but also in recognizing and "curing" them. Space cannot be given here to outline the nature, causes, symptoms, and methods of prevention, but the reader is referred for this information to the many fine

[8] *Safety in Athletics*, p. 199.

studies in the field, including those of the Harvard Fatigue Laboratory. The relationship between the length of practice periods to fatigue is discussed in Chapter V. Industry has been particularly interested in this phase of accident prevention, and Heinrich has this to say: "The workman with a fatigued mental, nervous, or muscular system is a bad risk for himself and his employer. Remove, or at least minimize, the sources of fatigue and you can radically reduce illness and accidents." [9]

Adolescents especially should be watched for overfatigue and nervous strain. The period of adolescence is characterized by rapid growth and many changes of the organs and structure of the body. "There is a conspicuous difference between the growth of the heart and the arteries. The ratio in size is 5:1 which means that the heart must pump blood into an opening only one fifth its size. This is hard work and puts a strain on the heart for a year or two." [10] Even though adolescents often seem to have unbounded energy, these facts should be considered for the protection of the growing boys and girls.

Varsity squads should be kept as large as feasible so that sufficient substitutes will be available for games. It has been proven again and again and is common knowledge that small squads in combat team sports tend to have a larger accident incidence. There are various reasons for this fact, but the element of fatigue and staleness is probably the most important. Small-squad players are often required to enter or re-enter a game when they have minor injuries or are fatigued, neither of which is desirable. This whole problem is closely associated with the administrative principle discussed earlier of scheduling schools of equal strength for fair competition.

Injured Players

The handling of injured participants in physical education classes has been discussed previously, but the question of in-

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[9] *Industrial Accident Prevention, A Scientific Approach,* p. 288.

[10] *Physical Education Course of Study for High School Girls.* State of Illinois, Superintendent of Public Instruction, prepared under direction of Don Cash Seaton, 1940, p. 13.

jured players in athletics is not so simple and requires more elaboration. Because of the pressure to win by the student body and townspeople and the usual desire of a player to play regardless of the injury, the coach often has to play a man when his better judgment would dictate otherwise. It must be remembered too, that opinions vary about the seriousness of an injury. The player usually belittles it, the trainer may be pessimistic, and even the doctors may have entirely different points of view. When a physician is not a sports fan he may prescribe the usual three or four weeks' rest for a sprained or strained ankle, whereas a team physician may prescribe only a few days rest and supervised exercises.

Thus the coach's decision about the advisability of using an injured player is a difficult one. From the viewpoint of safety, however, there can be little doubt that *players who have injuries should not be allowed to participate in either practice or games.* This would assume, of course, that such minor injuries as "strawberries" or slight contusions would not be considered in this category. The injuries referred to here would be mainly of two classes, those that would result in severe pain and those "old injuries" that might lead to future incapacitation. Although Stevens and Phelps do not explain what they mean by a minor injury, they comment, "Players who have injuries should not be allowed to participate in either scrimmage or game. Even minor injuries need rest and treatment."[11] The type and severity of the injury as a basis for determining the advisability of a player's participating must also be considered in respect to the sport or activity. For instance, a gymnast with an injured ankle might be able to perform creditably upon most apparatus; a right-handed tennis player with a sprained left wrist would probably not be handicapped severely, nor would either injury necessarily be aggravated. In other words, as one Western Conference Director of Athletics summarized, "It depends on the injury and the nature of the practice or game."

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[11] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps, Copyright 1933, by A. S. Barnes and Company, Inc. P. 15.

The coach should be the first to notice and take action when a student is injured, but if he does not, the injured player *should be removed* from the contest upon the advice of a physician, trainer, or captain. Often, however, a player is injured when neither a physician nor trainer is present. In that event the coach should remove the player if there is *any doubt* concerning the advisability of his continuance. When an injury has been considered serious enough to place the player under a physician's care, *only* the physician should be the judge of the advisability of the player's return to practice or to the game.

Fall Relaxed? It is a common conception among lay persons that one should relax when falling if injury is to be avoided. They usually point to drunken men as conclusive evidence. Dr. Deaver says, however, that anyone who has had experience in a hospital emergency ward knows this statement is not true, because of the disproportionately large number of drunks brought in with severe injuries. Stevens and Phelps, speaking of relaxation in relation to fatigue, point out that,

> It is a well-known fact that a blow of a given strength on a muscle will result in a rupture of the muscle if it is under tension, but will result in a fracture of the bone if the muscle is relaxed, and since fractures are, in general, more serious than ruptured muscles, it can be seen that there is a greater incidence of fractures when muscles are in a relaxed condition. Muscles under tension, therefore, act as a protection or splint for the bone, and by taking the injury themselves prevent more serious bone accidents.[12]

Physical educators have found that it is unwise to teach students to fall completely relaxed or completely taut. Tumblers are the most adept at "falling" and they soon learn to retain a sufficient amount of muscular tone to protect the bones and joints from unnecessary strain. Many football coaches spent a great deal of time teaching their players to fall safely, and such practice is recommended in all sports where there is the hazard of falling. Hartley Price, successful University of

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[12] *The Control of Football Injuries,* p. 17.

Illinois Gymnastic Coach, calls attention to the importance of proper falling,

> From the safety point of view, *the breakfall is the most important single skill in athletics.* But it is one of the most neglected areas of directed learnings. The viewpoint seems to have been taken that the art of falling will take care of itself. Falling is a part of all types of sports and therefore should be regarded as a necessary fundamental which should be included in the training of every individual.[13]

How Does Exercise Affect the Heart? Many persons believe that participation in athletics, especially distance running and rowing, causes an "athletic heart," which will bring about an early death. Nothing could be farther from the truth. Let us examine what Arthur H. Steinhaus, Professor of Physiology at George Williams College has to say.

> The heart of a well-trained distance runner at rest beats fifty to sixty times a minute. That of an average non-athlete must contract seventy to ninety times. But the athlete's heart is not lazy. With fifty beats it puts out more blood in a minute than does the non-athlete's with eighty, because it can pump more blood with each beat (almost three ounces instead of only two). Under the influence of exercise it speeds up correspondingly less.
>
> Why is a slow heart an advantage? Only when the heart is resting between beats can blood flow through its walls to supply it with oxygen and food. The slower the heart, the longer the rests; and these add up. The heart beating sixty times per minute gets eighteen days more of rest in a year than does the eighty-beat heart.
>
> Strenuous exercise that is continued over a long period of time is particularly good for training the heart. Trained hearts are larger, stronger, slower, and steadier. Exercises that emphasize strength, such as weight lifting and short sprints, develop powerful body muscles but do not tax the heart muscles enough. Wise athletes in these sports, therefore, balance their exercise program with some distance running, basketball, water polo, or other sports that develop heart and lungs and therefore endurance. Many sports are good heart developers.

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[13] "Tumbling and Stumbling Safely," *Journal of Health and Physical Education,* November, 1942, p. 533. Italics are author's.

There is an old-fashioned notion that exercise injures the heart. For this belief there is no scientific foundation. The term "athlete's heart" as applied to a heart supposedly injured by athletics has disappeared from scientific and medical writings. But this is true: A heart already injured by disease or other factors will suffer extra abuse under exercise. When the motor of a car is in good shape, fast driving will not hurt it; but should the pistons slap and bearings rattle, even slow driving is dangerous.

It is very important to have your heart, lungs, and other organs examined by a physician before engaging in any strenuous work. If the physician finds some defect, he will advise accordingly. The normal heart in a young person cannot be hurt by exercise. The middle-aged heart is different. It has lost resilience with age and very possibly may be already somewhat damaged. Therefore, the middle-aged person should not play like a twenty-year-old. Often persons with slightly affected hearts profit by moderate exercise if carefully supervised.

Smoking stands convicted not only of unnecessarily speeding up the heart but, what is more serious, of often having produced real and lasting damage by the time a smoker reached his forties or early fifties.[14]

Special Safety Problems for Girls

The physical education program for girls presents a few special safety problems. Among these are the advisability of interschool competition, the advisability of exercise during menstruation, and the rather minor problem of hazardous accessories and fingernails.

Exercise During Menstruation. *During menstruation, adolescent girls should not be required to participate in strenuous activities or swimming.* The key words, "adolescence" and "required" should be noted in this sentence. There have been many exhaustive studies and volumes of learned discussion with regard to the pros and cons of exercising during menstruation, but the above principle is promulgated on the basis of pure safety. An instructor or department can "play safe" by adopting the above policy. Steinhaus comments on this issue, "The best authorities recognize great differences in women's ability

[14] *How to Keep Fit and Like It*, p. 13.

at this time. They usually recommend that a girl carry on her regular program throughout this period, in so far as she feels herself capable of doing, avoiding both excessive exertion and cold baths." [15]

Those with valid doctor's excuses should not be allowed to participate. The key words in this admonition are "valid" and "allowed." A valid excuse is one given by a doctor for a real cause, not because the girl wants to "duck" physical education. Then the instructor certainly should follow the physician's recommendation and not allow the student to participate.

In contact sports *girls should not be allowed to wear hazardous pins, jewelry, or long fingernails.* Although such items may be considered extremely minor details, they are often responsible for accidents which can be quite painful. Many departments bar the wearing of these accessories during all activities.

Officials and Officiating Safety

It has been estimated that approximately 45 per cent of sports accidents due to inadequate leadership (which accounts for about 30 per cent of all sport accidents) are the result of poor officiating. If the safety of players depends to such a large extent upon officials, it follows that great care must be taken in their selection, training, and assignment.

In securing officials for games or contests, especially contact sports, those men should be selected, who are not only highly skilled in the technical aspects of officiating but who recognize their responsibilities for the prevention of accidents and discharge these responsibilities efficiently. The too common practice of permitting opposing coaches to agree upon officials whom they think less likely to penalize their respective teams often results in incompetency. Poor officiating usually results in a greater than normal number of injuries. *It is therefore recommended that officials for all contests be selected, trained, and assigned by competent non-partisan authorities.*

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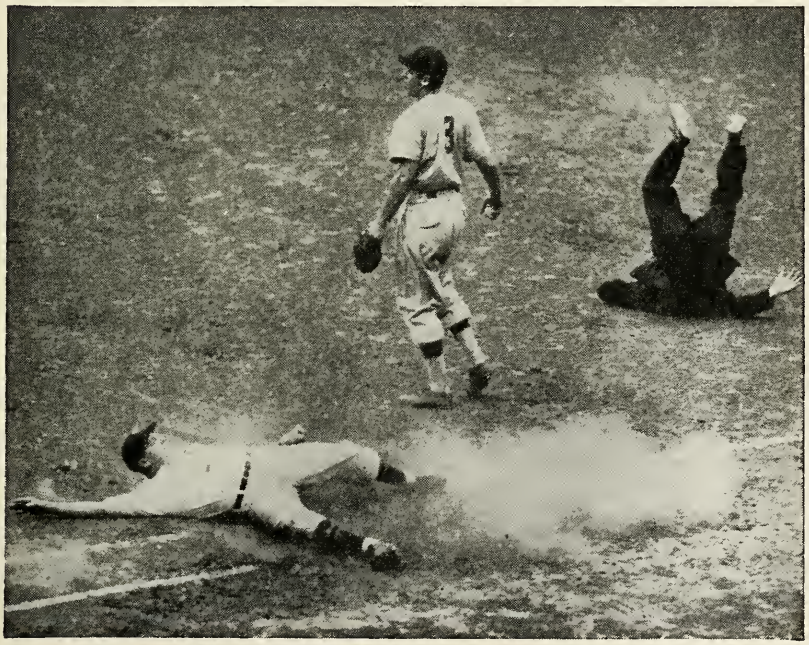
[15] *How to Keep Fit and Like It*, p. 17.

Official Has Complete Control. From the start of the game or contest, the safety of the players is almost entirely in the hands of the official or officials. Upon their interpretation of the spirit of the rules, as well as the rules themselves, and their strict enforcement depends not only the outcome of the game but also the number of injuries, and possibly fatalities, which will occur. The more experienced officials are very careful to enforce penalties for even the slightest infraction of a rule which may result in injury. The rules of almost every sport require officials to inspect equipment and to interpret questionable sections in such a way as to provide maximum safety. Such arbitrary authority should be invoked whenever a player would be protected from possible and unnecessary injury.

The safeguarding of players should be a primary objective



Acme Photos

FIG. 23. UMPIRES MUST BE ABLE TO TAKE IT!

Even baseball umpires get bumped occasionally. Art Passarella experienced this fall when a White Sox player ran into him trying to cover first base.

of all officials and officials' associations. An official's attitude plays an important role in the safeguarding of players. If he assumes the hardboiled I-don't-care attitude, players will naturally react unfavorably and the play will become rougher. This type of official, popular before the last decade, seldom lasts long in the game today. On the other hand, the official who is vitally concerned with the welfare of the players and at the same time performs in a business-like manner will usually promote fewer injuries during play.

Efforts should be made to discuss the various safety precautions pertaining to each sport during meetings of officials' associations. Rules-interpretation meetings, where both coaches and officials are present, afford excellent opportunities for an exchange of opinions on safety through officiating. Homer Allen, in an article on the official's responsibility in preventing accidents, said, "In many instances, it has been the far-reaching vision of athletic officials which has been responsible for improvements in the rules, equipment, and facilities of a game. The officials, not being directly connected with a school or college, have been able to recognize hazardous situations which have gone unnoticed by those in close proximity to the scene." [16]

Officials Should be Fit. It is strongly recommended *that every official have a thorough physical and medical examination prior to working in each sport.* Officials' organizations are urged to require such an examination. The examination would serve a twofold purpose: first, it would give the official an appraisal of his health status; second, it would inform the association of his physical ability to perform his duties. Requiring an examination prior to participation in each sport might appear unnecessary, but when one considers that many officials are quite old (athletically speaking) and that a strenuous season such as football or basketball, plus occasional illnesses, may take too much out of a man, it will be adjudged the sensible thing to do. A regular officials' examination blank should be used which informs the examining physician of the strenuousness of

[16] Homer Allen, "Responsibility of Athletic Officials for Accident Prevention," *Journal of Health and Physical Education,* February, 1947, p. 61.

the sport, the approximate number of games to be worked, the distances to be traveled, and the capacity in which the examinee will serve. Accompanying is a suggested form. To date, only one state, Pennsylvania, requires such an examination and this only as a condition of registration.

OFFICIAL'S PHYSICAL FITNESS REPORT

Sport .....

Name ..... Age.....
Address ..... Phone.....
Date of last actual competition in sports? .....
At what weight did you compete? ..... Present weight? .....
Date of last officiating? ..... Sport? .....
Type of exercise taken regularly? .....
What injuries or ailments have you had? ..... Dates .....
How many games or contests do you expect to officiate? .....
What distances will be traveled? .....
In what capacity do you usually serve? .....
Additional information: .....
.....

(*Reverse side for medical examination*)

FIG. 24. SUGGESTED OFFICIAL'S PHYSICAL FITNESS FORM
(For Use by Officials' Organizations)

Periodic physical and medical examinations of officials would help improve their fitness and might save many from injury and some from untimely death.

Officials should keep fit by engaging in some form of regular and suitable exercise, especially between seasons and before the opening of a season. Officials' organizations should encourage a physical fitness program among its members. Too many officials lead a sedentary life between seasons and work strenuously to get into shape a few days before the opening of the season. Calisthenics, particularly when taken under the supervision of a competent instructor, are especially recommended for officials. Such games as volleyball and golf are advocated for older men, and badminton, squash, and handball are excellent conditioners for the younger men. Fred H. "Brick" Young, for twenty years an outstanding official of the Big Ten and Big Six Conferences, says,

An official owes it to the game to keep in physical shape the year around, and it is imperative that every man working football start special preparations in the summer for the next football cam-

paign. In this way, the official can keep on top of the play and help prevent many injuries. Golf is an excellent conditioner for the veteran football official and I always play regularly every day from July on until the first game.

Officials should be well schooled in first-aid procedures. It often becomes necessary for an official to render first aid and to have sufficient knowledge to keep others, especially players, from injuring the victim further through improper treatment. It is recommended that officials' organizations spend some time in first-aid training of their members. It should not be the usual bandaging type, of course, but recognition training and the type given by a team physician or trainer where officials learn not to harm injured athletes further.

Officials should not overeat, especially before working a game or contest. Many officials have been former athletes who are prone to underexercise and overeat following their active competitive careers. (See Chapter V.) These men are cautioned against this tendency and urged to look upon officiating as the strenuous activity that it is. The mental and emotional disturbances prior to, during, and often following a game make it especially necessary for the official to eat moderately and wisely during this time. He should eat at least three hours before the contest and wait at least one hour following his work before eating again. Each official has usually worked out a diet he considers most agreeable for such periods, but he is warned to avoid excessive fats and carbohydrates, especially greasy foods.

Pre-Game Check-Up. Probably the first pre-game precaution that should be taken by an official is to make certain that he is *properly clad* for the occasion. He must wear sufficient clothing to keep warm and sufficient protective equipment to protect himself from injury. Vanity concerning his attire should not deter him from these sensible precautions. With the usual protective gear necessary for sports such as baseball and hockey, officials should have their ankles wrapped snugly for most activities and be careful to wear only perfectly fitting shoes.

It would be very wise for officials of basketball, football, and

such sports to *warm-up thoroughly before beginning their duties.* Light calisthenics in the dressing room and jogging to the field would help many an official avoid a painful sprain or strain.

Before beginning any game or contest the official or officials should report to the field or floor in sufficient time to make *a thorough safety check* of playing facilities and equipment. The rules of many sports require officials to report at a specified time, but often do not obligate them to make an inspection for the safe conduct of the contest. Such an inspection would include the condition of the playing surface, the proximity of the spectators, and the hazards of trees and walls, as well as the equipment of the players. When hazards exist such as players' benches being too close to the field of play or insufficient padding about the wrestling mat, the official should rectify conditions before beginning play. There may be certain other hazards such as shortened corners of a football field, or a fence in baseball which requires special ground rules or play compensation that should be determined. When weather conditions, unruly spectators, or other unusual happenings make it hazardous to begin or continue a contest, the official should have the good judgment and moral courage to call off the play.

When it is necessary, an official should remove from a game or contest any player who is dangerously belligerent, obviously fatigued, or painfully injured. Luckily, in this day and age, such action is seldom necessary, because the coach or captain soon recognizes these cases and removes them; however, in case of oversight, officials should realize their obligation. If no specific rule has been violated, this need not be done in an officious manner but by a diplomatic suggestion to the captain or coach. In wrestling and boxing the official must accept this responsibility and realize that upon his judgment may rest the life of a contestant.

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VII

SAFE ALL AROUND— THE ATHLETIC PLANT

General Equipment and Facility Controls

Administrators and physical educators have faced many perplexing problems in attempting to provide and maintain adequate and safe facilities and equipment to carry on the ever-changing and expanding program of physical education and athletics. Many of the present gymnasiums were constructed in an era when formal gymnastics dominated the physical education program and do not lend themselves to accomodating the varied activities of the present-day program. Similarly, the locations of most schools were not selected with a view to sufficient outdoor play space, and all too many are limited in this respect. Add to this the fact that many schools are forced to accommodate double and sometimes triple the number of pupils for which they were constructed, and it can be readily seen that the physical educator often meets a complexity of facility safety problems.

When the physical educator is called upon to make suggestions or submit requirements for the construction of new facilities, it is recommended that he confer with his State Department of Education, the United States Office of Education, university officials and other authorities, to make certain that the plan suggested will be functional and will meet future needs. For items of safety in construction and suitable sizes of playfields and gymnasiums the reader is referred to Chapter VIII. In the following discussion, *facilities* refers to permanent play areas

and dressing rooms, and *equipment* to the expendable gear used by the participants.

Inadequate Facilities and Accidents. The role played by inadequate or faulty equipment and facilities in accident causation tends to be overemphasized by teachers and coaches. When they were polled on the question, it was found that they attributed approximately 70 per cent of all accidents to such causes. Actually, Lloyd and Eastwood's study showed that in high schools only 20 per cent of accidents were due to inadequate equipment; in colleges for women, 27 per cent; and in colleges for men, 10 per cent. Pertinent figures are not available for elementary schools or playgrounds, but it is reasonable to assume that the percentage would be higher since more apparatus is used, and especially higher outdoors where apparatus is subject to deterioration because of the vagaries of the weather. Although the actual percentage of accidents resulting from inadequate or faulty equipment tends to be lower than that caused by leadership or nature-of-the-game accidents, they are accidents that can be almost completely eliminated. *There is no excuse for accidents occurring because of negligence in the care and maintenance of facilities or equipment.*

Specific Principles of Procedure in Eliminating Hazards

There are certain specific principles in the elimination of hazards which, if followed, should result in a safer environment and program in physical education, athletics, and recreation. They are:

1. Recognition and understanding of the hazards of all activities and facilities.
2. Removal of all unnecessary hazards of facilities, equipment, and programming.
3. Compensation through education and protective equipment for those hazards that cannot be removed.
4. Creation of no new hazards.[1]

Such knowledge and comprehension cannot be gained from a

[1] Stack and Siebrecht, *Education for Safe Living*, p. 94.

study of textbooks and safety rules, nor is it necessarily a by-product of participation in athletics; rather it requires a goodly share of each, plus administrative experience. Furthermore, each school presents certain hazards, especially facility hazards, that are peculiar to that particular school. The most efficient and accurate means of determining facility and equipment hazards is through an analysis of well-kept accident reports and by thorough inspections.

General Controls

The following safety controls were determined by a questionnaire survey of experts in the field of physical education, and from regulations advocated by various official agencies.

Inspection and Correction. All apparatus and facilities should be inspected and tested thoroughly before the opening of a sports season or semester, and should be observed carefully by each instructor at the time of use. It is probably best to make the inspection of facilities at the end of each semester so that repairs and replacements can be made before school reopens. Likewise, an inspection and inventory of equipment should be made at the close of each sports season so that equipment may be cleaned and repaired and orders placed for the following season. In large schools the semi-annual inspection requires considerable time and effort. The use of a checklist, as outlined on page 160, may be found useful in the survey. Similarly, a repair request blank, filled out by the teacher who discovers a faulty facility or a piece of apparatus, will not only facilitate the correction, but may exonerate the teacher and department in the event of a lawsuit. (Sample form on page 170). When possible, the defective apparatus or facility should be put away, roped off, or some such precaution should be taken for the protection of students. Custodians and students, particularly the safety leaders, should be encouraged to help with such surveys and be on the alert to report hazardous conditions. On page 168 are suggestions made by the National Safety Council for use in the survey of apparatus, with recommendations for general care of apparatus.

SAFETY CHECKLIST AND INVENTORY

Health and Physical Education Department

Semi-Annual Inspection ..... Made By: .....
(*Date*)
(*See preceding instructions.*) Custodian: .....

General Safe Practices

NO.	ITEM	YES	NO
1.	Are facilities checked for safety at least twice each year?		
2.	Do instructors check equipment and facilities before each usage?		
3.	Is there an established system of writing to the proper authority to report needed repairs to facilities?		
4.	Is apparatus put away, locked, roped off, or covered with mats when not in use under supervisor?		
5.	Are any activities conducted for which adequate protective equipment cannot be furnished?		
6.	Are intramural and physical education class participants furnished the same adequate protective equipment as the varsity?		
7.	Is there an established method of accident-reporting and follow-up?		
8.	Is there an established policy of rendering first aid and treating injuries received in physical education classes, intramurals, and athletics?		
9.	Is there an established policy of notifying parents regarding transportation and hospitalization of injured pupils?		
10.	Are the students taking physical education and participating in intramurals covered in the athletic benefit plan?		
11.	Are pupils assigned to activities or permitted to play on teams on the basis of health examinations, tests, and ability?		
12.	Are any classes or activities overcrowded for the facilities available?		
13.	Are passage facilities safe, and is there a safe system of pedestrian traffic within the athletic plant?		
14.	Are doors locked at any time in violation of fire ordinances?..		
15.	Is the number of spectators that is safe for each area determined and the limit strictly adhered to?		
16.	Are there adequate fire extinguishers in every area, and are all staff members trained in the methods of correct operation?		
17.	Are students trained in the proper fire-drill procedures for all areas and activities of the department?		

FACILITIES

	Inventory		*Safety Check List*	*Estimated Cost of Columns 2 and 3*
	No. on Hand	*Needed*	*Clean, Remove Hazard, Repair, Adjust, Oil, etc.*	
GYMNASIUM				
Balcony				
Basketball goals				
Bleachers,scorer'sbench				
Doors				
Floors				
Lighting				
Mats				
Running track				
Windows and screens				
APPARATUS				
Balance beams				
Beat-boards				
Bucks				
Ceiling belts				
Hand apparatus				
Horizontals				
Horses				
Jump standards				
Ladders				
Parallels				
Poles				
Ropes				
Springboards				
OUTDOOR				
Jungle gym				
Slides				
Swings				
Teeters				
DRESSING ROOM				
Benches				
Floor				
Lighting				
Lockers				
Scales				
Walls				
TOILET ROOM				
Floor				
Lighting				
Stalls				
Windows				

FACILITIES

	Inventory		*Safety Check List*	*Estimated Cost of Columns 2 and 3*
	No. on Hand	*Needed*	*Clean, Remove Hazard, Repair, Adjust, Oil, etc.*	
SWIMMING POOL Bleachers				
Decks				
Diving board				
Floating equipment				
Ladders				
Lighting				
Pool bottom and sides				
Rescue equipment				
Walls				
SHOWER ROOM Controls, faucets				
Floor				
Soap containers				
Thermostat				
Walls				
DRYING ROOM Equipment				
Floors				
Lockers				
Walls				
EQUIPMENT ROOM Baskets				
Electrical equipment				
Lockers and cabinets				
Tools and machines				
STORAGE ROOM Fire apparatus				
Storage cabinets				
OFFICES Chairs				
Desks				
Other				
TRAINING, FIRST-AID ROOM Cabinets				
Chairs				
Electrical facilities				
Hydro appliances				
Tables				
Walls				
Windows				

EQUIPMENT

Item	Inventory			Clean, Repair	Estimated Cost of Columns 3 & 4
	No. on Hand	Replace-ments	Needed		
GENERAL					
Inflators					
Jerseys, cotton					
Letter sweaters					
Lime liner					
Stop watches					
Supporters, elastic,					
aluminum or plastic					
Sweat pants					
Sweat shirts					
Sweat sox					
Undershirts					
Whistles					
ARCHERY					
Arm guards					
Arrows					
Bows					
Finger tabs					
Quivers					
Targets					
BADMINTON					
Nets					
Presses					
Racquets					
Shuttlecocks, new					
BASEBALL AND/OR SOFTBALL					
Balls, new					
old					
Bats					
Bases					
Gloves, catcher's					
fielder's					
first base					
Masks					
Pads, sliding					
Pants: practice, game					
Protector					
Shin guards					
Shirts: practice, game					
Undershirts					

EQUIPMENT

Item	Inventory			Clean, Repair	Estimated Cost of Columns 3 & 4
	No. on Hand	Replacements	Needed		
BASKETBALL					
Balls, new					
old					
Inner sox					
Jerseys, game					
practice					
Knee guards					
Pants					
Score books					
Sweat pants					
Sweat shirts					
Timer					
BOXING					
Gloves					
Head gear					
Heavy bag					
Mat covers					
Mats					
Mouth pieces					
Shoes					
Striking bag					
Trunks					
FENCING					
Jackets					
Foils					
Gloves					
Masks					
Strips					
FOOTBALL					
Balls, new					
old					
Blocking dummies					
Braces					
Charging sleds					
Field equipment					
Goal markers					
Head line's markers					
Helmets, game					
practice					

EQUIPMENT

Item	Inventory			Clean, Repair	Estimated Cost of Columns 3 & 4
	No. on Hand	Replace-ments	Needed		
FOOTBALL					
Jerseys, game					
practice					
Nose guards					
Pads, elbow					
hip					
kidney					
shoulder					
thigh					
Pants, game					
practice					
Shoes, game					
practice					
Stockings					
Tackling dummies					
Undershirts					
Windbreakers					
Yard markers					
GOLF					
Bags					
Balls, old					
new					
Clubs					
HORSEBACK					
Bridles					
Crops					
Halters					
Saddles and stirrups					
Spurs					
LACROSSE					
Arm pads					
Balls, new					
old					
Crosses					
Gloves					
Helmets					
Shoulder pads					

EQUIPMENT

Item	Inventory			Clean, Repair	Estimated Cost of Columns 3 & 4
	No. on Hand	Replace-ments	Needed		
TENNIS					
Balls, new					
old					
Nets					
Pants					
Presses					
Racquets					
Sweaters					
TRACK AND FIELD					
Cross bars					
Disci					
Javelins					
Jerseys, game					
practice					
Jump standards					
Measuring tapes					
Pants, game					
practice					
Shoes, jump					
sprint					
Shots					
Sox, light					
Spading forks					
Starting gun					
Sweat pants, game					
practice					
Sweat shirts, game					
practice					
Rakes					
Vaulting poles					
HOCKEY, ICE AND/OR FIELD					
Balls, new					
old					
Elbow pads					
Gloves					
Helmets					
Pucks					
Shin guards					
Shoes					
Shoulder pads					
Sticks					
Stockings					

EQUIPMENT

Item	*Inventory*			*Clean, Repair*	*Estimated Cost of Columns 3 & 4*
	No. on Hand	*Replace-ments*	*Needed*		
SOCCER					
Balls, new					
old					
Elbow pads					
Jerseys					
Knee pads					
Middies					
Shin guards					
Shoes					
Stockings					
Trunks					
WRESTLING					
Head gears					
Jerseys					
Mat covers					
Mats					
Shoes					
Sweat pants					
Sweat shirts					
Tights					
Undershirts					
TRAINING ROOM SUPPLIES					
Alcohol					
Ankle wraps					
Bandages					
Benzoin					
Cotton					
Depressors					
Gauze					
Iodine					
Liniment					
Oil					
Swabs					
Tape					
OTHERS					

1. Apparatus in which wood is employed, such as slides, swings, teeters, and giant strides, should be inspected for worn or split portions or slivers.

2. All apparatus should be examined for broken parts, rough corners, projecting corners or clamps, and loose joints, bolts, and fastenings.

3. Chains, ropes, fastenings, and clamps should be examined regularly for signs of deterioration or looseness.

4. All minor repairs and adjustments should be made immediately.

5. All unsafe apparatus should be removed or roped off so that it cannot be used while it is in a dangerous condition.

6. All needed repairs or parts should be reported to the principal at once.

7. All movable parts and connections should be frequently inspected and well lubricated. It is good practice to replace yearly the parts of apparatus subjected to the most strenuous wear.

8. All exposed surfaces should be treated regularly with a preservative coating. Metal surfaces may be painted and wood surfaces treated with linseed oil and varnished.[2]

Before the safety checklist is used, it is recommended that the users acquaint themselves with the various safety controls enumerated in this chapter and Chapter VIII.

Bleacher Erection and Maintenance. Bleachers and grandstands are probably the most neglected and the most potentially dangerous facilities of the school athletic plant. It is usually assumed that permanent stands will remain safe forever and that manufacturers will sell only trustworthy, demountable bleachers. Yet each year their collapse is responsible for hundreds of deaths and injuries. Administrators are urged to give the erection and maintenance of bleachers the serious consideration it deserves.

Demountable bleachers should be erected only by reliable workmen who will follow the directions of the manufacturer and realize the implications of careless workmanship. It is not advisable to invest students with this responsibility. A solid foundation must be provided for the A-frames. Seat stringers and A-frames which can be dislocated should be wired into

[2] *Safety in Physical Education and Recreation,* p. 36.

place. They must never be erected on soft or wet ground which will allow dislocation. One manufacturer stated, "We urge the careful inspection of our bleachers prior to and during their use. Small boys can remove sustaining members which immediately affects the strength of the entire bleacher." Because *permanent outdoor grandstands* are more likely to deteriorate, special care must be taken to test and repair them before the opening of each season. This responsibility is best delegated to a competent engineer. Only his official approval will protect the administrator in case of failure. All permanent structures should be inspected regularly for such relatively minor items as protruding nails, splinters, and broken boards. (See Chapter VIII.)

Manufacturers of demountable bleachers and builders of permanent grandstands should be engaged to inspect the stands for safety periodically. Not only are these engineers best qualified to pass upon the safety of the stands, but also they should take a pride in their product's being well maintained and in its security.

Heavy Apparatus. Much of the so-called heavy apparatus of the gymnasium and playground has stood the test of time as to value and safety, but accident records reveal that certain pieces cause more accidents than others. According to the National Safety Council if it is possible to gain the same value through other safer apparatus and equipment, the dangerous kind should be eliminated.

In addition to periodic inspection and intelligent leadership, the *proper placing* of apparatus will do much to eliminate the danger of collision. Indoors the instructor must arrange the movable apparatus so that sufficient space is available for all exercises, and performers are not likely to be struck by equipment or participants of other sports. This important aspect is discussed more thoroughly in Chapter X. All permanent outdoor apparatus should be located in a fenced-off space or around the edges of the playground where it is less likely to interfere with the sports areas. This aspect of safety is discussed more thoroughly in Chapter VIII.

Safe Place for Storage. All equipment and movable apparatus should have a safe place for storage and should be kept there at all times when it is not in use under supervision. Although it is not possible for all schools to follow this procedure because of inadequate storage space, the practice is a desirable one from the standpoint of safety. Often apparatus can be set away from the practice area in a safe location. Although much of the playground apparatus cannot be so put away, it is customary to permit its use only under supervision. On the col-

REPAIR REQUEST

To the Maintenance Department: The following facilities or equipments are in need of repair:

Faulty Equipment .....

.....

Place .....

Suggestions .....

.....

Signed: ..... Room ..... Date .....

REPORT ON REPAIR REQUEST

To ..... The following disposition has been made of your repair request:

.....

.....

.....

.....

Signed ..... Date .....

(Maintenance Department)

FIG. 25. SUGGESTED REPAIR REQUEST FORM AND REPORT

The use of such a form furnishes a record for reporting repair needs and may protect the instructor in case of a misunderstanding or even a lawsuit.

lege level such provisions for safety are probably less necessary, for the students are more mature and usually less likely to ex-

periment with dangerous stunts. Some coaches feel, too, that unless the apparatus is available, students will not have an opportunity to develop an interest or recreate during leisure moments.

Playing Surfaces. Except for cross country running, golf, horseback riding, and aquatics, all playing surfaces should be level, smooth, dry, free from harmful extraneous materials, and of proper texture for the sport or activity. It is understandable, of course, that the playing field cannot always be dry, but from the standpoint of safety this is desirable. The proper texture of the field depends upon local weather and ground conditions, as well as upon the use to which it is to be put. In football, soccer, speedball, and other games in which falling to the ground is common, grass provides the only suitable surface. Crowded play areas demand an all-weather surface which is both practical and safe, and to date no one formula has proved successful under all conditions. The National Recreation Association claims that a good play surface should have resilience, good drainage, freedom from dust, durability, nonabrasiveness, cleanliness, firmness, smoothness, general utility, good appearance, and be procurable at a reasonable cost. (See page 205.)

No matter what type of surface exists, constant care must be taken to keep the play areas free from extraneous materials which may cause injury, such as rocks, cinders, glass, and tin cans. Also it is necessary to keep the surface free from holes and bumps, because uneven surfaces cause many ankle and knee injuries as well as a large variety of other falling injuries. Dust is a hazard to health and safety and must be controlled. It can best be allayed by the use of calcium chloride or one of the successful commercial compounds developed for this purpose.

Indoor Surfaces. Indoor surfaces seldom present the problem of unevenness, but are more likely to cause injuries because they are slippery. The most satisfactory finish has been the so-called bakelite treatment. This finish provides a very attractive and cohesive surface which insures safe footing when good rubber-soled shoes are used. Many schools using this finish have found it advisable to provide a canvas cover, not only

for use when the gymnasium is converted into an auditorium but for dancing on as well.

The use of the old-fashioned powdered wax for dancing should be discouraged, because it leaves the floor too slippery for the safe conduct of classes. If it is used, it is essential that the floor be thoroughly scrubbed with a caustic soap and hot water to restore the required friction. It is recommended that boric acid powder be used instead. This powder is quickly dissolved in water and has antiseptic properties.

According to the National Safety Council, water waxes (emulsions), if properly applied, will permit a floor to be used safely for physical education activities. When a dancing surface is required, a thin film of wax can be applied and buffed to a high gloss.

Before gym classes are resumed, the original coefficient of friction may be restored by wet mopping of the floor. Wet mopping means mopping with warm or hot soapy water by placing liberal quantities of the solution on the floor with the mop and allowing it to remain for several minutes. This is then mopped off the floor and is followed by mopping with clear water. In some cases the desired effect has been obtained by dusting the floor with an anti-slip compound, such as feldspar, before sweeping up at the close of the dance.[3]

If floors are not especially filled and sealed, they should be thoroughly cleaned as often as necessary and mopped at least once a week.

All playing surfaces should be free from surrounding or overhanging obstructions likely to cause injury. This requirement is impossible of fulfillment where supporting pillars, stairs, or other permanent construction hazards exist. Besides abandoning the activity in that area, the activity area can be restricted or the hazard may be padded or otherwise lessened. On the other hand, there are certain facilities, such as drinking fountains, radiators, and permanent apparatus, that can and should be relocated if they present unusually hazardous condi-

[3] *Safety in Physical Education and Recreation,* p. 30.

tions. Eight to ten feet is customarily considered a safe height above which projections are permissible. Empty bleachers in the gymnasium are often dangerous, especially when cross-court play is in progress. The safest bleachers from this standpoint are the folding type, which can be removed from the playing court when they are not in use. The type of bleacher that folds flat against, or into, the wall is probably safer than those types that leave an uneven front. If they are of the permanent or knockdown type that is not removable, it may be necessary to place mat covers over them at dangerous locations. Insufficient space between the side lines of the play area and the wall, bleachers, or fences is a common hazard. When such distance cannot possibly be widened, steps should be taken to pad, or otherwise lessen, the danger.

Suitable Outdoor Play Areas. Outdoor facilities have often been provided solely for interschool competition in the various sports. It has been a too common practice for high schools to build a football field enclosed by a running track and stadium and then put up the "keep out" sign for all other activities. Almost any remaining undeveloped space has been considered good enough for the other sports, with the exception of tennis. "The mass of the student body has been compelled to play on inadequate space and hazardous surfaces," [4] conclude Lloyd, Deaver, and Eastwood. Many facility-caused accidents occur because of overcrowding and because of playing a number of sports at the same time in a restricted area. This is particularly true of the so-called "free play" periods and other loosely organized and unsupervised groups of activities.

Outdoor play areas should be sufficiently large and well cared for, and when it is necessary to use a common area, the space should be properly allocated according to the various activities for the age and sex of the players. In planning such allocation, the prescribed areas required for various sports should be considered. (See page 187.)

Marking Play Areas. Most sports require that their play

[4] *Safety in Athletics*, p. 192.

areas be defined by lines. Such lines often mark danger zones and should not be allowed to become indistinct or to be omitted entirely. There is a tendency to omit such lines in track and field events where their use is most helpful in defining the danger zones of such events as the discus, javelin, and running broad jump. Lines are also very helpful around apparatus areas and for use in segregating groups, thus preventing playground accidents. Slaked lime or whiting, applied wet, or white sand should be used to mark outdoor play areas. *Unslaked lime should never be used* because of the danger of burns. White tape lines are often used in court games, but care must be taken to keep them well pinned down or they become a tripping hazard. It is customary to use different colors to distinguish the various play areas in the gymnasium and to indicate danger zones of apparatus and swinging doors.

Temporary areas for special squad events in physical education classes should be carefully designated to avoid the dangers of collision. The permanent areas, such as jumping pits, outdoor running track, and indoor horizontal bars and ladders, are definitely established and provide segregation to a certain extent, but many activities do not possess such designated areas. When a class is divided into squads participating in games of low organization, relays, and hand wrestling, as well as basketball, apparatus, and soccer, care must be taken to define clearly the areas of activity, or injury may result from collisions. It may be advisable to indicate these various areas on a blackboard located where the classes form.

Safe Indoor Areas. Indoor play space is usually at a premium. Since the physical educator can do little to expand the space available, it becomes necessary for him to restrict the number of persons who may use the facility at one time and to adjust the activity program in accordance with the number permitted. In most schools it has been customary for the student to schedule all other classes and then "fill in" gym at a vacant hour. This has often resulted in overcrowded classes at certain hours and classes too small at others. It is therefore recommended that administrators arrange to schedule physical

education classes first, so that an equal distribution of class and teacher loads can be made.

Doors swinging into play areas should be reversed or slowed down by means of doorstops, or lines should be painted on the floor to show danger areas, or leaders posted where it is necessary to protect the players. Such doors can be extremely dangerous, because students coming to the gymnasium are usually hurried and feel active and rush through the doors with little thought of the consequences. Another precaution that can be used on doors is the painting of signs such as those with "Open Slowly" on one side and "Caution" on the other. Doors that swing in both directions should be eliminated, and where possible, no doors should be used. All gymnasium doors should have recessed handles.

Pool and Service Rooms. *Locker, shower, and drying room floors and pool decks should be of nonslip material.* If they are not, corrugated rubber mats or wooden platforms can be used. The matter of slippery floors in these areas has perplexed architects and safety engineers for many years. There is no satisfactory method of correcting the slipperiness of floors constructed of tile, terra cotta, and terrazzo. The use of rubber mats and wooden platforms has not proved satisfactory from the hygienic standpoint, and some instructors feel that their use does not reduce the number of accidents. Homer Allen of Purdue University recommends the use of nonslip marine paint on the floors. One of the best solutions to the accident problem is to prohibit running and roughhousing on the part of users of the locker rooms. Keeping the locker room floors dry by not allowing bathers to enter the room until they are dried off is another important administrative control.

To prevent scalding, showers should be equipped with mixing valves. The temperature of the water should be thermostatically controlled and should never be permitted to exceed 100 degrees F. If such safety devices are not available, effort should be made to keep the temperature from exceeding 100 degrees, and users should be constantly instructed in the method of safe usage. *Liquid soap* is safer than bar soap for use in

shower rooms. This is because bar soap is often left on the floor and becomes a slip hazard. It is also recommended that the liquid dispensers be of metal and that the soap be of good quality.

Footbaths should have nonskid bottoms, because the antiseptic used usually adds to the slipperiness of the container.

The bottom and sides of the swimming pools should be cleaned as often as necessary to keep them from becoming slippery. The weekly use of a modern vacuum cleaner usually suffices. Also the pool decks must be mopped or squeegeed often to prevent them from becoming dirty and slippery. *The instructor should inspect the diving board* before class or team usage for possible weakness and hazardous surface. The principal danger from a broken board is to those who happen to be underneath it at the time of breakage. It is advisable not to allow swimmers to go beneath the board while it is in use.

Gym and locker room doors should not be locked in violation of fire laws as a means of controlling attendance and theft. It is a common practice in departments of physical education to employ this very dangerous method of policing the various rooms. It is recommended that a check be made with the fire marshal, and if the practice is judged by him to be dangerous, it should be discontinued.

Proper Lighting. All play areas, shower and locker rooms, and corridors should be properly lighted. This is a safety factor that is very often neglected in passageways, on stairs, and in dressing rooms, particularly when they are located in the basement. If an unusual number of accidents are occurring in those areas, it would be advisable to check on the foot-candles of illumination. (See Chapter VIII). Usually there is not much that can be done about improving the natural lighting of an existing gymnasium. Some type of shade should be provided, however, to keep the sun out of the players' eyes, because temporary blinding may be responsible for an accident. Also, when it is necessary, artificial lighting should be used to supplement the natural light.

With the rapid growth of night football and baseball, the

lighting of outdoor areas has become of paramount interest. From twenty to thirty foot-candles are recommended for such play, and unless this minimum can be provided, a school would be wise, from a standpoint of safety, not to attempt staging night contests. Forsythe, in a survey of night contests in Ohio, Pennsylvania, Kansas, and Michigan, reported that the schools "were virtually unanimous in indicating that there was no difference in the number or severity of athletic injuries received in night football as compared with the daytime game." [5] In this connection it must be considered that both teams and spectators are required to go to and from the game at a time when the traffic-accident rate is highest.

Adequate Personal Equipment. Adequate protective equipment should be furnished to, and worn by, all contestants in those sports or activities which require it. In the preceding section it was recommended that a school should not sponsor an activity for which adequate facilities of equipment cannot be provided. The practice of requiring players to furnish part of their own equipment, such as shoes and shoulder pads in football, is to be condemned from the safety standpoint, because often poor equipment is purchased and allowed to deteriorate. Football, hockey, lacrosse, and boxing are sports which require especially adequate gear. It will be noted that these sports rank high on the hazard list because they are contact sports. The rules may specify the equipment necessary for game participation in these sports, but there is no such requirement with regard to the practice field. Also there are very few or no rules requiring that equipment be of the most effective style or that it be properly fitted. Since statistics indicate that the largest number of accidents occur during free play and practice periods, it behooves the coach or instructor to insist that players be supplied with adequate protective equipment and that they *wear* it. Usually coaches and trainers are better qualified than the players to select the proper style of protective equipment, as well as to place it properly.

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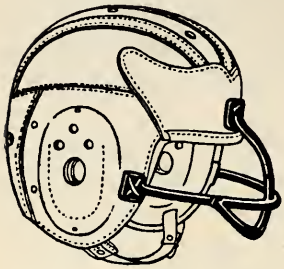
[5] *The Administration of High School Athletics,* p. 334.

The best quality, most efficient, and most protective equipment should be purchased. Coaches learn from experience the brands and styles of equipment that are most satisfactory. Many, especially college coaches and equipment men, are also adept at devising special types of equipment for the protection of their athletes. It is recommended that all coaches study this important phase of safety and bend every effort to see that the

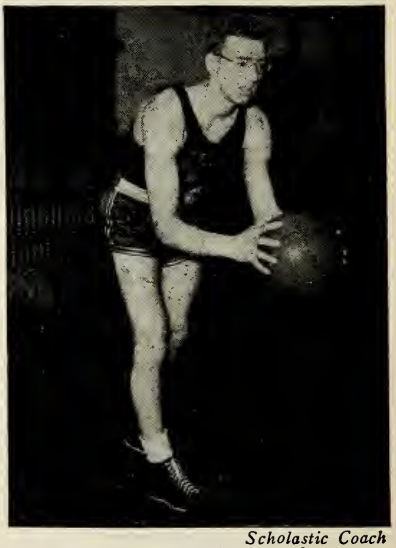


Courtesy of A. G. Spalding & Bros., Inc.

FIG. 26. (*a.*) Football nose- and eye-guard on helmet. Such guards have proved satisfactory to the wearer, but may cause injury to the heedless opponent.

Scholastic Coach

FIG. 26. (*b.*) These new plastic eye-guards may prove satisfactory and popular.



Scholastic Coach

FIG. 26. (*c.*) If spectacles must be worn, they should be of plastic frames and safety glass.

best protection possible is made available to all athletes in all sports. The secretary of one State High School Athletic Association points out that the most expensive equipment is not necessarily the best.

A. L. Anderson, *Technique of Fitting Contact Lens.*

FIG. 26. (*d.*) Contact lenses, although expensive and worn for only short periods, may be the answer to the ametropic athlete's problem.

Athletic Supporters a Safety Factor? Opinion varies regarding the safety factor involved in the use of the common elastic supporter. Many coaches feel that its use prohibits the testes from floating to the side, as nature designed, when one is hit in the groin, thus making the use of a supporter a hazard rather than a protection. Others contend that such support prevents the testes from being pinched between the legs and otherwise protects them from harm. The author believes that each individual must experiment and decide this issue for himself, but recommends the elimination of the elastic supports whenever possible. The use of the aluminum or plastic cup is a definite safety factor when it is properly fitted and used. Its use in all contact sports is recommended.

Is Wrapping of Ankles a Safety Factor? Taping of

normal ankles to prevent injury in athletics is a moot question among coaches. One school of thought holds that reliance upon this support tends to weaken the ankle, whereas others believe that such support only at the time of play could not possibly have this effect. Coach Hanson of Eastern Illinois State Teachers College expressed the opinion of many when he said: "I do not think it necessary. Many boys in high school and college do not like this practice." Coach Doug Mills of the University of Illinois is one of a number of outstanding coaches that favor their use. Many coaches require such wrapping for both practice sessions and games, which practice Coach Adolph Rupp of Kentucky says has a definite tendency to weaken the ankles. All are agreed, of course, that weak or injured ankles should be wrapped for play. Many trainers believe that ankle wrapping, especially rigid taping, is responsible for a large number of knee injuries, because the ankle is rendered unable to absorb some of the necessary twist. Mat Bullock thinks there is sufficient evidence supporting this theory to limit the amount of wrapping.

Eye Protection. *If a participant must wear spectacles for team play, guards or nonshatter glass should be worn.* This rule applies to any activity in which there is danger of the person being struck by another player or by a piece of equipment. The spectacle frames should be made of plastic and should be form-fitting. In contact sports, such as football and lacrosse, the guard can be worn successfully as a part of the helmet, whereas in other sports it must be self-supporting and is less satisfactory. The recently developed plastic eyeglass guards are becoming popular and may replace the old steel-cage type.

Another recent development, the nonbreakable contact lens, offers the ametropic athlete a convenient and safe type of correction that may become universally adopted in sports participation. These lenses have proved very satisfactory for use in noncontact sports and in baseball and basketball. Their use in football and boxing is being tested and they may prove most convenient and safest for such contact sports. The prohibitive cost and short periods that contact lenses can be worn with comfort have retarded their use.

Safe Training Supplies

School and college training and first-aid departments should retain and dispense only the simplest medical supplies necessary to render first aid. Poisons, of course, should be properly labeled and made inaccessible for general use. It is not a wise practice to transfer medicines, especially poisons, to bottles not intended for their storage.

Inflammable materials should never be stored or used within the athletic plant. There have been several explosions with serious results from using inflammable materials in training rooms for the removal of adhesive tape. Ether is another highly explosive chemical that must be handled with care. Those responsible for the purchasing of training and first-aid supplies should make certain that they are nonexplosive.

Special protective equipment for each sport is discussed in those chapters dealing with safety in sports.

Service Personnel Plays Major Role in Safety

Physical educators are prone to underestimate and to capitalize upon the influence which service personnel exerts in the safe conduct of the program. To this staff falls the responsibility for maintaining the athletic plant, and whether or not they provide maximum safety depends upon the attitude and diligence of the workers. The director of physical education and athletics (and staff) should consider the custodial staff as an integral part of the department and make every effort to dignify their work. When the service-staff members feel that they are accepted and relied upon, and when they are made conscious of the important safety role which they play, better maintenance results.

Custodians and Engineers. To enumerate the safety aspects of the custodian's and engineer's work would require the listing of all their jobs. Almost all such work has some safety significance; these men are not dealing with safety in the abstract. It can be readily recognized that many of the items previously discussed in this chapter are controlled almost entirely by the service staff. They are particularly warned not

to sacrifice safety for beauty in the maintenance of the plant. The following safety contributions can be made by custodians and engineers:

1. The custodian, with the director of physical education or designated persons, should make the semi-annual safety inspection of facilities.
2. The custodian should check the grounds and indoor facilities daily for defects or extraneous materials that may cause accidents and injury.
3. When a facility or piece of equipment is unsafe for use in his opinion, the custodian should so declare it in writing to the proper authority. He should first render the item unusable until made safe again.
4. The engineer should inspect the bleachers for safety before each usage, and if he is in doubt, prohibit their use.
5. A custodian should be present during all athletic contests to provide maximum safe use of facilities for both spectators and players.
6. The custodian and engineer must be aware of the special hazards of the swimming pool and shower rooms, and of the water heating and purification plant.
7. Engineers and custodians must rigidly enforce all fire laws and fire-protection measures.
8. They should be qualified to render first aid when necessary.

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VIII

SAFETY IN NEW CONSTRUCTION

When the physical educator is called upon to make suggestions and state the requirements for the construction of new facilities, it is recommended that he confer with the State Department of Education; the United States Office of Education; The Joint Committee for Standards for Physical Education and Athletics; The American Association for Health, Physical Education and Recreation; The College Physical Education Association; The National Council on School House Construction; and other authorities to make certain that the plan selected is functional and includes modern developments that will meet future as well as present needs. He is urged to be well-informed on the safety implications of the physical education and athletic programs so that he can advise the architect, because built-in hazards are impossible or difficult to correct.

Survey of Needs

In planning a gymnasium or other athletic and recreational facilities, it is important that the administrator first make a survey of the community life and of its facilities and needs. This would include a study of population and housing trends, existing school and community recreational facilities, and possible sites. Wise planning calls for the selection of school sites many years before construction. A complete analysis of the present school enrollment and student needs should then be made. Only through such means can present and future requirements be determined intelligently.

Selecting the Architect

In building a gymnasium, field house, swimming pool, or stadium, many factors enter into the selection of the proper architect. It is not within the scope of this text to discuss these various factors. One admonition, however, should be stressed. Select an architect who has had considerable experience in building athletic facilities and who has designed buildings that reflect vision in meeting physical education needs.

Informing the Architect. The director of physical education or athletics should be cognizant of the hazards of athletic plants and able to inform the architect of the safety implications of the physical education and athletic programs. Although a competent architect is expected to know and observe the building codes governing the proposed structure, as well as to possess other technical knowledge with regard to construction for safety, all architects cannot be expected to be familiar with the varied program to be accommodated with its multiplicity of hazards. Early gymnasiums, built during the horse-and-buggy days of physical education, were expected to accommodate a formal program of calisthenics and apparatus, and it has been difficult for the architect and builder to keep pace with the changes in the program so as to design buildings suitable for its safe accommodation.

Therefore, the prospective builder (the school administrator) should furnish the architect with an outline of the complete physical education program and its hazards as it exists and as he expects it to be in the future. From this knowledge the architect should be able to fashion a structure of sufficient size, utility, and flexibility to insure a minimum number of injuries resulting from structural mistakes. Many architects, however, must be carefully supervised or they will sacrifice utility for appearance.

General Principles of Safe Construction

There are several general principles of construction for safety that should be followed if an intelligent approach to the

problem is to be made. Each of the following suggestions has a definite bearing on the other, so that each should be considered in relation to the other and to the desired objectives.

Facilities must be constructed in accordance with state building codes and local ordinances covering fire, panic, and other hazards. Probably the first step the athletic director or director of physical education should take in planning the construction of a new facility is to consult the architect on the safety restrictions and recommendations of governmental agencies. This step is required for intelligent planning, since certain adjustments are made necessary by these codes. The architect and administrator may want to go beyond these regulations and consult the safety codes of such national organizations as the National Safety Council, the National Conservation Bureau, and the National Fire Protection Association.

Facilities must be safely and conveniently located. It is desirable that the athletic plant, especially the gymnasium, be separate from the remainder of the building because of the fire danger to large crowds of spectators. Special care must be taken to see that it is not located over or near an explosion hazard or near any structure that might be considered a fire hazard, nor should the power plant of the school be located in or near athletic buildings. It is not desirable to have gymnasiums, playgrounds, or athletic fields divided by, or adjacent to, railroads, heavily traveled streets, or bodies of water. If the location of playing fields makes it necessary for students to encounter traffic hazards, underpasses or overpasses should be constructed. Otherwise, it will be necessary to install signals or assign traffic officers or safety patrols.

Facilities should be large enough to allow for their safe use by peak loads. It is generally recognized, and studies have proven, that overcrowding is responsible for a high accident incidence. With this in mind, new construction should be planned to insure sufficient space to care for the largest number of participants at any given time. The determination of the proper size and number of facilities is a very difficult problem because of the rapid expansion and changing concepts of the

TABLE XVI

Needed Space for Safe Play

(Measurements in feet; Bleacher space not included)

Sports	*Dimensions of Playing Area*	*Sq. Feet Playing Area*	*Outside Safety Zone END (Minimum)*		*Outside Safety Zone SIDES (Minimum)*		*Total Area Needed (Minimum)*	
			To Wall or Fence	*Between Courts or Bleachers*	*To Wall or Fence*	*Between Courts or Bleachers*	*Dimensions Plus Safety Zones*	*Square Feet*
Archery (outdoor)	500 to 300 x 450	22,500	10	150	10	50	50 x 450	22,500
Badminton (double)	20 x 44	880	8	6	8	5	32 x 56	1,792
Basketball	42 x 72 (minimum)	3,024	8	6	6	6	54 x 84	4,536
Baseball (hard)	90 x 90 (diamond)	8,100	60*	550**	30	30	300 x 300	90,000
Baseball (soft)	60 x 60 (diamond)	3,600	30*	350**	30	30	250 x 250	62,500
Boxing (ring)	20 x 20	400	8	4	8	4	28 x 28	784
Fencing (strip)	5′ 10″ to 6′ 6″ x 40	233	4	6	6	8	18 x 48	874
Field Hockey	150 to 180 x 270 to 300	40,500	20	10	10	10	160 x 280	44,800
Football and Touchball	160 x 360	57,600	20	10	15	10	180 x 380	68,400
Golf Driving Net	9 x 18 x 9 high	162	8	4	4	4	17 x 30	510
Handball (one wall)	20 to 30 x 34 to 45	680	8	6	8	6	32 x 46	1,472
Handball (four wall)	22 x 46 x 22 high	1,012					22 x 46	1,012
Ice Hockey	60 to 110 x 165 to 250	9,900					60 x 165	9,900
Lacrosse	210 to 260 x 450 to 500	94,500	15	10	15	10	230 x 470	108,100
Soccer (men)	150 to 300 x 300 to 390	45,000	15	10	15	10	170 x 320	54,400
Soccer (women)	120 to 180 x 240 to 300	28,800	10	6	10	6	132 x 252	33,264
Speedball (men)	160 x 240 to 360	38,400	15	10	15	10	180 x 260	46,800
Speedball (women)	180 to 200 x 300 to 340	54,000	10	6	10	6	192 x 312	59,904
Swimming Pool	40 x 75	3,000	15		8		56 x 105	5,880
Tennis (double)	36 x 78	2,808	21		16		60 x 120	7,200
Track (outdoor)	24′ x 440 yds.	31,680	10	6	10	6	260 x 610	158,600
Volleyball	30 x 60	1,800	8	6	12	8	46 x 72	3,312
Wrestling (ring)	18 x 18	324	10	10	10	10	28 x 28	784

*To backstop. **Between home plates of facing diamonds.

physical education program. Table XVI specifies the space needed for safe play in the various sports, and Table XVIII on page 194 lists the recommended sizes for gymnasiums as determined by the Joint Facilities Planning Committee of the American Association for Health, Physical Education and Recreation, and the Physical Education Division of the National Collegiate Athletic Association. Administrators are warned that the tendency is to build units that are too small and inflexible. Provision must be made for future expansion if population trends seem to warrant it. Fifteen acres should be considered the minimum area necessary for the high-school athletic, physical education, and recreation plant; ten acres the minimum for the junior high school; and seven acres for the elementary-school program. College plants require at least twenty-five acres. It must be remembered, however, that a facility used eight times a day by eight groups of 60 students is equal to the same area used only four times a day by groups of 120, or six times a day by groups of 80. In other words, safer and more efficient use is made of facilities when the load is spread out. It must also be kept in mind that only twenty players can be accommodated on a softball diamond, and only four on a tennis court, regardless of the size of a class or the school enrollment. Recommended sizes for gymnasiums can be found on page 194.

Facilities should be *so constructed that it will be possible to segregate* the various activities, age levels, and sexes. Above the third grade it is usually considered desirable to segregate the sexes, but further segregation by age groups is considered necessary from the safety standpoint. (See Chapter V.) Segregation may require the provision of more than one gymnasium, or movable partitions, or separate dressing facilities, and will also require separate areas on the playfields. These items will be discussed elsewhere. Facilities should be so constructed that the *activities may be easily supervised.* This provision applies to both indoor and outdoor play areas. Such items as the proper location of the instructor's office and the location of the small children's playground near the school building are representative of provisions to meet this principle.

Consideration must be given to the safe construction of

facilities for *adults* when the athletic plant is used for community recreation. More and more the school is returning to one of its earliest uses—serving as a community center—and the athletic facilities often form the nucleus for such activities. It is therefore particularly desirable to plan the athletic plant with the safety of adults in mind. This would include such major items as direct accessibility to the department, an accessible first-aid room, elimination of steps, and such minor items as the installation of handrails in showers and swimming pool.

Building Construction for Safety

The buildings must be constructed in accordance with state and local building codes. The vast majority of these rules and regulations are directed toward the prevention of fire and panic and means of escape in case of fire. Some of these provisions should be mentioned because of their importance.

All buildings should comprise as few stories as possible, preferably one. The gymnasium should be placed slightly above ground level and spectators should never be housed higher than the second story. The reasons for this are obvious, the most important being that, in the event of fire, large numbers of spectators might be trapped in the higher stories, with resultant loss of life. The National Fire Protection Association recommends that no balcony exit be higher than twenty feet above the finished grade.

Sufficient safe interior stair exits should be provided for the handling of peak loads. It is generally recognized that outside fire escapes are not desirable and that smokeproof tower stairways should be installed. Exits should be adequate to empty the peak load of the building in a minute and a half. The building code will specify the number and size of exits required to handle the largest expected crowd. *Adequate fire-fighting equipment* must be included and housed in such a way that it will not be hazardous to passers-by. Local ordinances will specify these requirements. Storage space and service rooms that may be fire hazards should be furnished with automatic sprinkler systems.

The Heating and Ventilating System. It is strongly

recommended that radiant floor heating be used in dressing rooms, showers, toilets, and special exercise rooms where cold floors are a source of discomfort and a possible health hazard. It may also be desirable in the gymnasium proper. When steam or hot-water heating is used, radiators should be of the overhead type or else recessed, with screen protection if it is necessary to install them lower than eight feet. A mechanical system of ventilation should be installed in the gymnasium, but whether it is or not, windows must be provided that will operate mechanically and not be hazardous when opened.

Lighting for Safety. Natural and artificial lighting should be sufficient to insure safety in dressing and showering and in passing to and from the athletic facilities. For natural illumination, bilateral lighting is desirable. Windows should be placed as high as possible (at least ten feet above the floor), and should not be located at the ends of the gymnasium unless glass that diffuses the light sufficiently to prevent glare is used. The windows should cover a wall area equal to one fourth or one fifth of the floor space. *Glass brick* gives promise of being the ideal type of natural illumination for gymnasiums, field houses, and swimming pools. Prospective builders are encouraged to investigate its use for windows and walls. Fluorescent lighting may prove the most satisfactory artificial illumination for indoor recreation areas.[1] Two basic minimum requirements are:

1. There must be sufficient quantity of light (foot-candles). Since players are often required to look directly toward the source of light, it is difficult to furnish sufficient brightness yet not "blind" the players.

2. The light must be so applied that the distribution of brightness (foot-lamberts) in the visual field does not cause un-

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[1] The Illuminating Engineering Society Liaison 1946 Report of the National Council on Schoolhouse Construction said, ". . . The inference was well established that fluorescent was the only artificial light source that could produce the recommended foot-candle standards efficiently." p. 19.

necessary annoyance or discomfort. Recreation areas present a problem in this respect too, because the eye must follow moving objects and an excessive variation in the intensity of illumination is annoying.

Current recommended standards for the various athletic-plant areas are shown in Table XVII.

TABLE XVII

Current Recommended Lighting Levels

Areas	*Foot-candles*
Gymnasium and Swimming Pool	30
Locker Rooms, Washroom, Corridors containing Lockers, Stairways	10
Football Fields	20–30
General Playfields	10–15
Baseball and Softball	30–40

It is recommended that *germicidal irradiation* to kill airborne germs and bacteria be installed in certain areas of the plant. It would be particularly valuable for use in the first-aid or training rooms, locker and dressing rooms, toilets, and in special exercise rooms where large numbers of persons congregate in small spaces for strenuous exercise. Such ultra-violet irradiation is desirable in the gymnasium or field house where large crowds gather but is probably impractical. All light fixtures should have screen protection.

Gymnasiums and Field Houses

In addition to the general construction suggestions mentioned above, there are several specific safety items which should be incorporated in the construction of a gymnasium or field house.

Space Around the Courts. It is recommended that a distance of at least six feet be provided between walls or bleachers

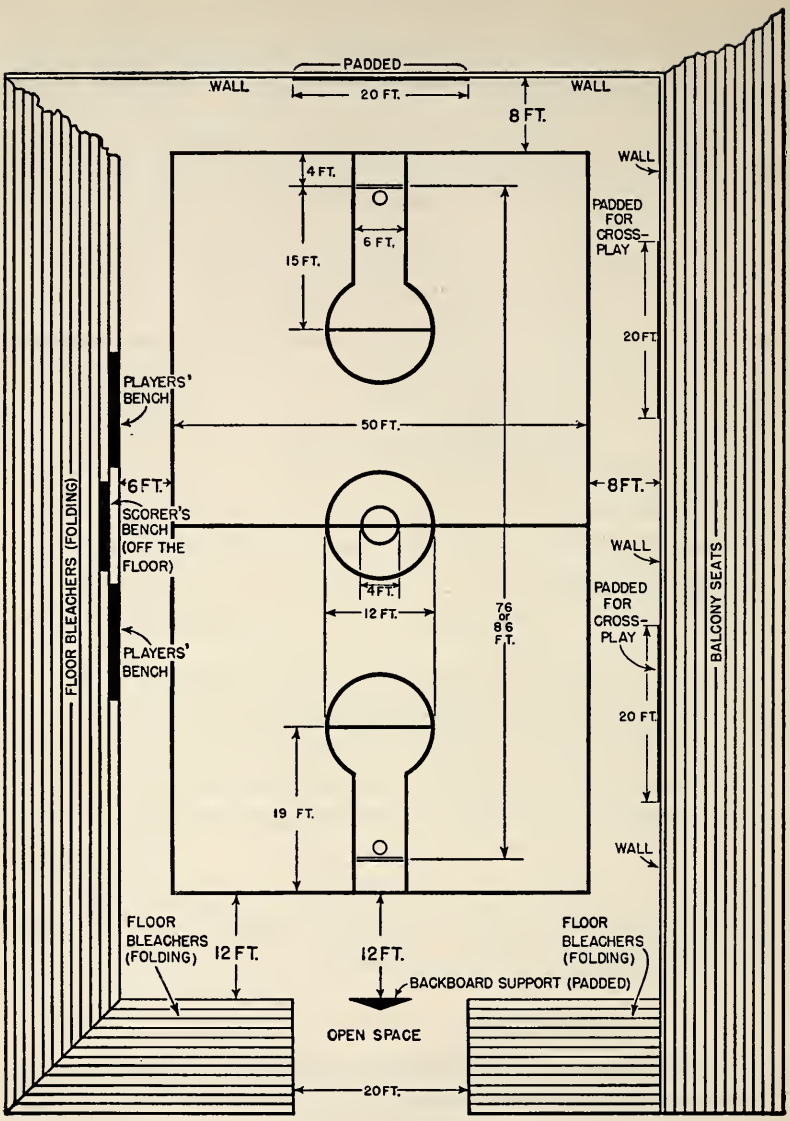


FIG. 27. DIAGRAM OF A BASKETBALL COURT

Recommended safety zones surrounding basketball courts.

and the side lines of basketball, volleyball, badminton. (See chart, page 187.) Where shorter distances are necessary, as is often the case in wrestling, boxing, and special exercise rooms, nonhazardous hangers or wall boards should be installed on the walls for the suspension of protective mats. At the ends of the basketball court there should be *at least* eight feet between the end line and the wall or basket supports. Here again, when shorter distances are necessary, provision should be made for mat coverage. There should be an open space of at least sixteen feet behind each goal, and the bleachers on either side of the goal should be at least six feet from the end line. The portable basketball floors used in field houses should extend farther than these recommended minimum distances because of the step-off danger. (Some of the spaces around the courts recommended by the Committee on Physical Education Facilities of the American Association for Health, Physical Education and Recreation, as shown on page 194, are not considered sufficient by the writer.)

Doors. All doors should be sufficiently large to permit free movement of required numbers and equipment. Upper panels should be constructed of safety glass to permit the persons approaching to be forewarned of the presence of others. When it is necessary to have doors near play areas, the handles should be recessed. Doors should always be operative from the inside. No door should open directly into a play area, and, of course, exits must always open outward. Such doors should not open into corridor cross traffic, but should be set back so that they will not be a hazard to passers-by. If this is not possible, it may be advisable to install baffles in the traffic lanes as a protective measure. Doors opened by photoelectric devices could be considered for use in this area.

Walls. Walls should be light in color, of a nonabrasive texture, with rounded corners, and free of obstructions, such as radiators, to a height of at least ten feet. Permanent apparatus should be so erected that it will not be a hazard when not in use. Those wall spaces too close to play areas and the obstructions impossible to eliminate should have nonhazardous brackets

TABLE XVIII

RECOMMENDED GYMNASIUM SIZES [2]

	Size	*Basketball Court*	*End and Side Safe Zones**	*Seating Space*	*Ceiling Height*	*No. and Size Teaching Stations***	*Approximate Seating, Folding Bleachers*	*Tiers of Seats*
I. Elementary	80 x 50	74 x 42	4 and 4	0	20	2—50 x 40	0	0
II. Junior High	90 x 65	84 x 50	8 and 6	12	22	2—65 x 45	325	7
III. Senior High (Girls)	102 x 65	90 x 45	6 and 6	8½	22	2—65 x 51	265	5
IV. Senior High (Boys and Girls)	96 x 76	84 x 50	6 and 6	15′ 7″	22	2—76 x 48	500	9
V. Senior High	100 x 93′ 2″	84 x 50	6 and 6	15′ 7″	22	2—93′ 1″ x 50	1000	9
VI. Senior High	104 x 104	84 x 50	10 and 6	24	24	2—52 x 104	1500	14
VII. Senior High	133′ 6″ x 96	50 x 84	6 and 6	35′ 9″	24	2—96 x 66′ 9″	2500	20

*Note: End and side safety zones are considered too short in some instances. See chart.

**Teaching Station $= \frac{\text{Total enrollment}}{\text{Class size}} = \frac{\text{No. of P. E. classes daily}}{\text{No. of periods daily}} \times 1.25$ (Schedule efficiency weighing).

[2] The National Conference on Facilities for Athletics, Recreation, Physical and Health Education. *A Guide for Planning Facilities for Athletics, Recreation, Physical and Health Education.* Chicago: Athletic Institute, 1947, p. 127.

or wall boards installed from which protective mats can be suspended. Water fountains and expectorators should be countersunk and located outside of play area.

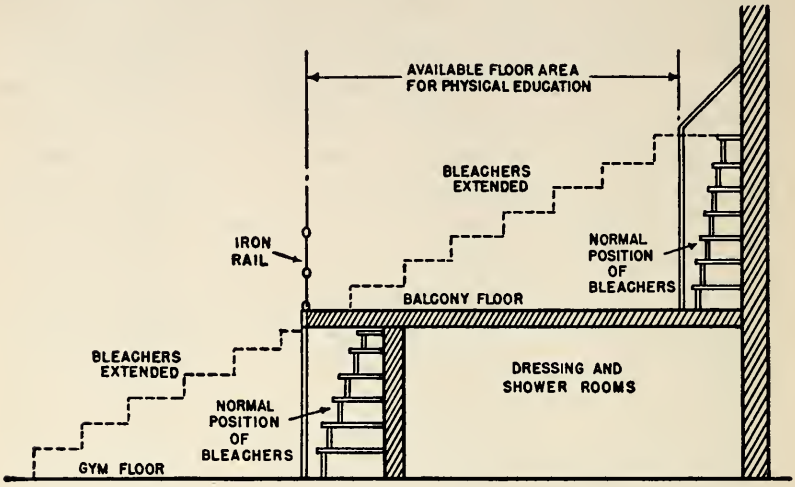
If it is necessary to divide classes, a folding partition should be used to separate the gym floors. From the standpoint of safety, the most satisfactory method of separating groups is by means of a motor-driven, folding steel partition which prevents the students between the two areas from bumping into one another. A net serves to segregate the groups and keep balls from flying into the wrong areas, but it has not proved satisfactory for general class division because it does not keep out sound or sight. Many physical educators feel that a canvas partition causes more injuries than it prevents, because players often collide when they are unable to see each other. Canvas and net partitions are probably most useful in field houses when they are used to segregate such activities as golf and baseball practice, which are particularly dangerous indoors if they are not confined to their respective areas.

Windows in play areas should be of shatterproof glass and/or covered with protective screens.

Acoustical Treatment. Acoustics undoubtedly have a great deal to do with safety in indoor play. Reverberations add to confusion, and confusion contributes to the hazards of recreation. It is therefore recommended that indoor play areas, especially the gymnasium and swimming pool, be properly treated for soundproofing.

Floors. The most important safety consideration in the selection of the gymnasium flooring is that it provide a resilient nonslip surface. Since slipping is one of the major causes of accidents in the gymnasium, every precaution must be taken to eliminate this hazard. At the present time, the hard maple floor is the most popular. Regardless of the type of wood used, the so-called bakelite finish has proved the safest and most satisfactory. Some schools have found linoleum, cork, and other composition floors very satisfactory, especially for recreation rooms. They are usually softer but lack the gripping power of the bakelite finish. These materials are less likely to cause

blistered feet and abrasions than hardwood floors. Before installation, wood floors should be treated with a fire-resistant material, especially those above the first floor and those not laid over concrete. Boxing and wrestling area floors should be completely padded and covered with canvas.



Higgins, Chicago Board of Education

FIG. 28. BLEACHERS MUST BE SAFE

Arrangement of folding recessed bleachers on floor and balcony for maximum use of space and safe storage, recommended by the Illinois State Division of Health and Physical Education and devised by Thomas J. Higgins, Chicago Board of Education.

Stairs and Ramps. Ramps of moderate slope should be provided instead of steps wherever possible. It is readily recognized that ramps insure a much safer footing for ascending or descending to other levels. This is particularly true of places designed to handle large crowds in a limited time, such as stadiums and basketball gymnasiums. They should not exceed a one-foot fall in ten feet. The surfaces of stairs, ramps, and platforms should be of nonslip material. According to John E. Marshall, Supervisor of School House Planning for the State of West Virginia:

Adequate stairway calls for two stairways, at least 48 inches wide, for every building two stories or more in height, with 24 inches of clear width for each 60 persons on any floor above the first. 'Clear width' is measured between handrails, which are provided on each side of the stairs. An intermediate handrail is provided where stairs exceed 72 inches in width.[3]

Stairs or ramps from permanent bleachers should not lead directly to the playing floor or swimming pool. If it is necessary to have them, they should be recessed and placed outside the playing area. Those leading to the athletic field should have at least a one-quarter turn to prevent players from rushing in and out of the building. Stairs should have at least ten foot-candles of light at all times. Where it is necessary, treadwell lights should be installed. At the outside entrances to the buildings there should be sunken areas for foot mats or grills. Raised mats or grills cause tripping and falls.

Bleachers

Safety must be a primary consideration in the selection of bleachers. Permanent steel and concrete bleachers are usually the safest, and the wooden knockdown type the most hazardous. The folding steel bleachers have become extremely popular for indoor use and have proved quite satisfactory from the safety standpoint. The architect should provide space for them to be folded into the wall to eliminate the hazards of an uneven surface. Permanent bleachers should be so constructed that they will not allow a person to slip down through them, which is a type of accident that occurs occasionally when either knockdown or folding bleachers are used. Some of the folding types are constructed to minimize this danger and should be selected for this reason. It is recommended that guard rails be installed at the ends of all bleachers which do not finish against a wall. The American Standards Association requires these rails to be placed at the rear and ends of seats higher than four feet from the ground. Manufacturers of demountable bleachers and builders of permanent grandstands should be engaged to inspect

[3] "Blue Print for Safety," *Safety Education,* December, 1944, p. 129.

their product periodically to pass upon the safety of the stands.

Regardless of the type selected, bleachers should be so constructed that they will bear a vertical live load of at least 125 pounds per lineal foot of seats and floor boards, and at least 24 pounds sway load per lineal foot. They should also be designed to resist, *without* live load, a horizontal wind load of 30 pounds per square foot of all surfaces in the vertical projection of the stand, and *with* full live load, one half of the above wind load.

Demountable bleachers higher than fifteen feet and permanent grandstands greater than twenty feet should be constructed of steel, concrete, or materials of equal strength. Wood should be used only for seats in stands of these heights.

Other Exercise Rooms

Other exercise rooms, such as the apparatus, corrective, or adapted gymnasium and recreation room, should conform to the general suggestions mentioned, but in addition they should include special construction features for each activity to be housed. Squash and handball courts must be absolutely free of obstructions; wrestling and boxing rooms should have completely padded floors and walls, to a height of six feet, and recreation rooms should be arranged for the segregation of ping-pong tables, golf-driving net, shuffle boards, and other games.

In addition to germicidal lighting and radiant floor heating for certain rooms, air-conditioning should be considered for wrestling and boxing rooms, as well as for dressing rooms in warm climates.

Storage Space

Because apparatus, equipment, folding chairs, knockdown bleachers, and other items may be hazardous when they are left in recreation areas, sufficient space should be provided for their safe storage. The sizes of such rooms should not be determined by the amount of leftover space, but should be based upon need. The National Council on Schoolhouse Construction recommends a minimum of 200 square feet. The architect must be

apprised of the amount of equipment to be stored. Storage space must be accessible, well lighted and ventilated, must have wide double doors, and, if possible, include an automatic sprinkling system. In addition, each gymnasium should be equipped with a built-in storage cabinet in which supplies used daily, such as volley balls, nets, basketballs, and bats, may be kept. Where a piano is to be used, it is desirable to provide a built-in storage space in the wall of the gymnasium or special exercise room. This provision allows for its convenient use as well as for safe storage.

Service Rooms

Dressing Rooms. Probably the most important safety item in the construction of the dressing, showering, and drying rooms is the provision of nonslip flooring. No entirely satisfactory material has been developed, but the safest is generally believed to be tile or terra cotta. If cement is used, it should have a pulverized steel or carborundum finish or be painted with marine nonslip paint.

The room must be large enough to accommodate the peak load safely, allowing approximately four square feet of space per user. Lockers should be spaced with a minimum of six feet between rows to permit free and safe movement of users. It is recommended that stationary benches be installed to prevent the hazards of movable benches. No fixtures, such as pipes and radiators, should be exposed where they are a hazard to those dressing.

Shower Rooms. Shower rooms should be large enough to accommodate the peak loads. Approximately fourteen square feet of floor space for each shower head, and one shower head for each four to six pupils of the peak load is recommended. The old-fashioned individual shower type for girls is not recommended for a number of reasons, among them, the added hazards of so much extra equipment. If "runway" showers are to be installed, the lane should be at least thirty feet in length and have directional changes to prohibit bathers from running through.

Here again, the nonslip floor and nonabrasive walls are the most important safety precautions. Shower pipes should not be exposed, and control valves should be of the self-mixing type. The temperature of the water should be thermostatically controlled not to exceed 100 degrees F. Fewer accidents occur when wheel controls, instead of levers, adjust the flow of water. The slope of the floor for drainage should not be so great that it makes footing hazardous. Electric lights should be controlled by a remote switch that is outside the shower room. An electric fan blower will eliminate the accumulation of steam, which often is responsible for accidents in the showers.

Drying Rooms. The floor of the body-drying room should be of a nonslip material. Pegs or racks for the hanging of towels should be at least seven feet from the floor to eliminate the danger of striking them. Benches or stools should not be provided in this room.

Toilet Rooms. From the standpoint of safety, doors should not be provided on toilet stalls; lavatories should have mixing-type water faucets; and floors should be of the same texture as the nonslip dressing room floors.

First-Aid and Training Rooms. The first-aid or athletic training room should be planned *for these purposes only,* and so located as to be readily accessible from all parts of the athletic plant and other school buildings. The entrance must be large enough to insure easy access for a stretcher patient. There should be sufficient electrical outlets installed to eliminate the need for makeshift wiring. Plumbing fixtures and therapeutic devices should be planned and installed with a view to their safe use by patients. There should be an available space which can be locked for the safe storage of poisons and medicines that might be dangerous when they are not used under supervision.

Swimming Pool

The swimming pool should meet the standards of safety and sanitation established by the state authorities. Thirty states require the submission and registration of plans, blue-

prints, or reports to the State Department of Health. The size and depth of the pool and the installation of diving boards should be determined in conformity with approved safety standards. In large institutions a beginners' pool should be provided. This minimizes danger for beginners and allows the regular pool to be of uniform depth, which is safer for regular uses. *There should be no pillars, columns, or other obstructions surrounding the pool.* Such obstructions are dangerous to pool users. It is wise also to avoid the installation of railings and balconies that present a diving challenge to swimmers.

The instructor's office should be so located and provided with such large windows that full view of the pool is afforded. The office should also contain telephone facilities and storage space for auxiliary lifesaving equipment. The walls of the pool room should be of a nonabrasive material and free from obstructions to a height of at least eight feet. Provision should be made for the safe installation of lifesaving equipment.

Underwater pool lighting, which is a definite safety factor, is recommended for all pools. It should not, however, be placed at the ends of the pool because of glare for racers. Underwater lighting provides guidance for swimmers and eliminates dark portions of the pool that may prove hazardous. *The decks should be of a nonslip material,* preferably of rough tile or terra cotta. Marble and terrazzo should not be used for this purpose. The decks at the sides should be a minimum of seven to eight feet in width, ten to twelve feet at the shallow end, and fifteen to twenty feet at the deep end. From the safety standpoint, there should be no curb or coping surrounding the pool, and the edge should be rounded. Many authorities feel, however, that a rounded coping of at least one inch is necessary for sanitary reasons. The coping should be constructed of nonslip tile with oatmeal or similar finish.

The slope of the bottom should not be too steep nor should it have steps or too sudden changes in level. The spoon-shaped bottom should be avoided. The pool should be so designed that its slope approximates a plane with a reverse or ogee curve, having a gradual slope in the shallow area, a steeper slope in

the diving area, and a moderate slope at the point of greatest depth at the end of the pool. It should not exceed a one-foot fall for a distance of fifteen feet in the shallow area, and not more than one foot in three for the deeper portion. Protruding ladders are a definite hazard to pool users. In multiple-use pools, step holes or recessed steps should be provided for climbing out of the pool. The step holes should be at least three inches wide and have rounded corners. There should also be small depressed handholds to assist the swimmer in climbing. Pools for advanced swimmers only may dispense entirely with such ladders. Large permanent numbers marking the depths of the pool should be placed in conspicuous locations. Such marking is of great value to beginners and intermediate swimmers.

Diving boards should not be installed unless there is sufficient pool depth, and width, and ceiling height to insure safe usage. There should be at least twelve feet ceiling clearance for either the high or low board. The minimum safe depth of water for the low board is ten feet, and for the high board twelve feet. The pool must be at least thirty feet wide before it is safe to install a diving board. The board should be covered with cocomatting, or similar material, to prevent slipping.

Construction of Playfields for Safety

In planning playfields, one should consider at least four important areas of construction for safety: fencing, surfacing, bleachers, and apparatus. Each of these will be discussed in the following paragraphs.

The Athletic Field. The most common arrangement of the athletic field is the quarter-mile running track with a football field enclosed, usually surrounded by bleachers. Sometimes a baseball diamond and jumping pits are included. Probably the most important safety precaution to be observed is the proper placement of the jumping pits. In baseball permanent or movable back-stops must be provided for the protection of spectators.

Jumping pits for field events and tackling-and-blocking

areas should be so located that they will not interfere with the safety of performers in other sports. If they are located near the playing field, provision for covering them should be included in the construction plans. The curb of the running track should be rounded and not greater than two inches in height. Removable curbs have proven successful on tracks—such as the one at Soldiers' Field, Chicago—which are used extensively for other activities. The water drains and hose bibs of the field should be located below the surface and should be covered so that they will present the least amount of danger.

Turf is almost universally considered the best surfacing for football, soccer, field hockey, and other games that require a player's falling or being thrown to the ground. Where an all-weather surface is necessary, experts, such as those of the National Recreation Association, should be consulted.

In addition to the athletic field, it is necessary to provide playfields for physical education classes and practice fields for athletics. These fields should be level, well-turfed or surfaced in accordance with the requirements of the sports, and free from obstructions likely to cause injury. There must be permanent backstops for tennis, and permanent or movable ones are desirable for softball. The out-of-bounds of the various sports should be placed at safe distances from walls, fences, trees, and other obstructions. The courts and playing fields of the various sports should be so placed that the rays of the sun will fall across, not lengthwise of, the playing areas. Football, soccer, lacrosse, and other sport fields and courts should run approximately north and south, and the baseball diamond should be so located that the batter will face northeast.

Fencing. *The athletic field and the football field should be well fenced.* It is usually necessary to place a high fence around the entire area, not only to exclude gate crashers and trespassers, but also to prevent players from dashing out into traffic. This fence should be placed a few feet inside the boundary to allow space for landscaping. A fence is also desirable around the football, soccer, and lacrosse fields to prevent spectators from coming too close to the field of play. The out-

door archery range should also be fenced. The fence must be of a type that will not cause injury to spectators but will nevertheless keep them off the playing field. The "outside" area used by the weight-event men for the discus, shot, javelin, and hammer throws, as well as for the archery range, may also need protective fences. Sidewalks, streets, and parking areas should also be fenced, when necessary, to prevent traffic hazards.

Fences should not be of barbed wire or other injurious material, unless they are used as topping at least eight feet from the ground. The required safe height varies from five to eight feet, depending on the neighborhood and the amount of actual protection that is required.

Outdoor Grandstands. Outdoor permanent grandstands and demountable bleachers should meet the same weight-bearing strength as those recommended for indoor bleachers. (See page 198.) Where is is possible, natural grandstands should be fashioned from the terrain. Such ampitheaters are safest and most economical to maintain.

The Playground

Probably the most important safety factor in the construction of a playground is the proper segregation of the various age and activity groups. The pre-school group requires a segregated area for the mothers and their youngsters; the small children require a segregated swing, slide, and teeter-totter area; older children should have an apparatus area, open spaces for baseball and other games, and court areas for basketball and tennis. *All the different play areas should be well defined by the terrain, shrubbery, benches, or fences.* This is particularly true of the dangerous areas surrounding the apparatus.

Surfacing. In each community a type of playground surface must be selected that is suitable for the given area and "workable" in that location. Cinders, chipped granite, or crushed rock should never be used for a play surface. The proper texture for the playfield will depend upon the local weather and ground conditions as well as upon the use to which it is to be put. In football, soccer, speedball, and other games

in which falling to the ground is common, grass supplies the only suitable surface. Crowded play areas demand an all-weather surface which is both practical and safe, and, to date, no one formula has proved successful under all conditions. A good play surface should have resilience, good drainage, freedom from dust, durability, nonabrasiveness, cleanliness, firmness, smoothness, general utility, good appearance, and should be procurable at a reasonable cost. The National Recreation Association suggests the following:

TABLE XIX

SPACE REQUIREMENTS FOR APPARATUS [4]

Type of Apparatus	*Dimensions of Apparatus*		*Approximate Use Space Requirements in Feet*	*Space in Square Feet*
	Length in Feet	*Height in Feet*		
Balance Beam	12	.5	6x20	120
Climbing Structure (average)	10	10	20x20	400
Climbing Tree or Ladder	5 dia.	12	10x10	100
Giant Stride		12	32x32	1,024
Horizontal Bar	6	8	12x20	240
Horizontal Ladder	12-16	6.5-7.5	10x30	300
Junglegym (junior)	6.5	7	12x15	180
Junglegym (medium)	10	10.5	20x20	400
Merry-go-round	10 dia.	3.5	25x25	625
Sand Box	6x10 (min.)	1	15x20 (min.)	300
See-saws (set of 4)	12	2	20x20	400
Slide	16	8	12x30	360
Slide, Gang	16	8	25x40	1,000
Slide, Kindergarten	8	4.5	8x20	160
Slide, Racer	16	8	20x30	600
Swings (set of 3)	15 at top	12	30x35	1,050
Swings (set of 6)	30 at top	12	30x50	1,500
Swings (set of 4)	18 at top	10	24x30	720
Swings, chair or hammock				
(set of 3)	10 at top	8	20x20	400
(set of 6)	20 at top	8	20x30	600
Traveling Rings (in line)	40 at top	12	20x60	1,200
Traveling Rings (circular)	10 dia.	12	25x25	625

Hard surfacing of cork, asphalt, rock asphalt, cut back tar, hot mix asphalt, asphaltic oil with sawdust, stone chips or spruce shav-

[4] From *New Play Areas* by George D. Butler, Copyright, 1928, by National Recreation Association, Incorporated, Published by A. S. Barnes and Company, Inc. P. 240.

ings, premixed asphalt laid cold, and many patented or trademarked products give what is generally considered to be the best all-around surface for general heavy usage. Such materials allow year-round use even shortly following heavy rainfall, require practically no maintenance, permit easy marking of court lines, serve for games requiring accurate balance as well as for general play activities, and avoid the harmful effects of dusty playgrounds. Dust can be reduced to a minimum through the use of calcium chloride and certain oil products designed especially for this purpose.[5]

The administrator interested in solving this problem in his local community would be wise to contact the National Recreation Association for further advice. The United States War Department has also published recommendations for such surfacing. The National Safety Council recommends that outdoor-apparatus areas be surfaced with torpedo sand, gravel, loam, tanbark, or limestone screenings.

Apparatus. Only approved apparatus of the best quality should be purchased and installed. Such apparatus as merry-go-rounds, ocean waves, and giant strides are hazardous and of questionable value. Apparatus should be placed in protected areas near the schoolhouse or gymnasium or around the edges of the playground where it will be less likely to interfere with the sports areas. Table XIX indicates the amount of space necessary for the various types of apparatus. Swings, slides, and the like should be set in concrete and tested to make sure that they are vertical or horizontal and safe for use. The top of the base should be crowned and smooth in order to shed water, and the concrete should be allowed to harden three to seven days before the apparatus is used.

Soft landing surfaces of sand, shavings, sawdust, tanbark, cottonseed, or other suitable materials should be provided around all apparatus from which the child dismounts from a height or with considerable force. Redwood shavings are not suitable for this purpose because of their infectious nature.

Bicycle Racks. Bicycle racks should be provided for the safe storage of bicycles while children are at play.

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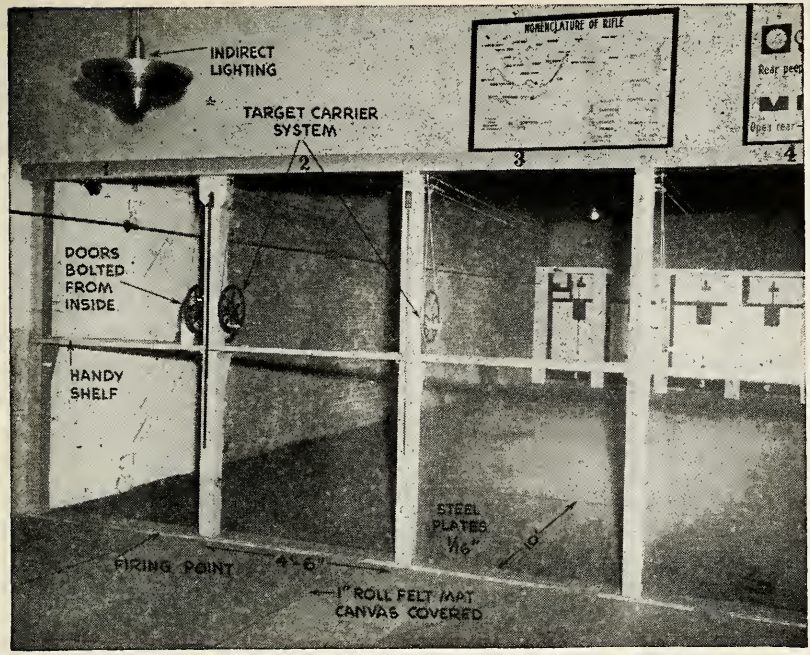
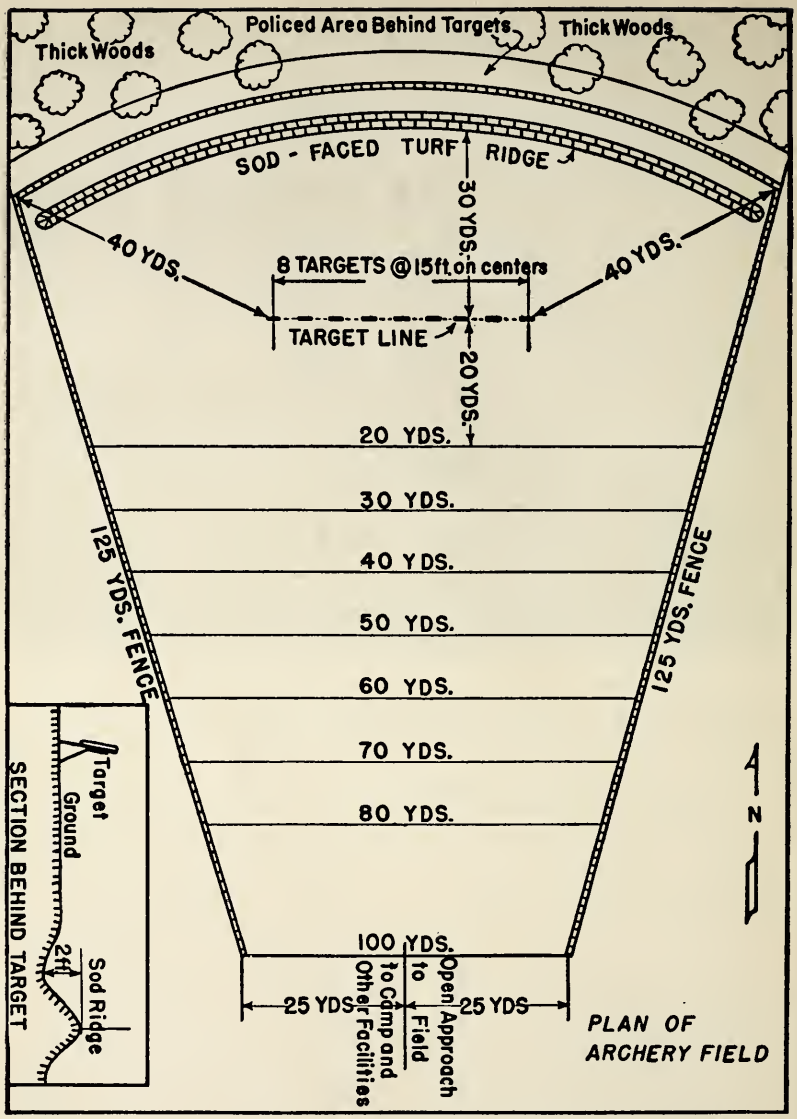
[5] *Safety in Physical Education and Recreation,* p. 28.



National Rifle Association

FIG. 29. CONSTRUCTING A SAFE RIFLE RANGE
This diagrammatic picture gives the safety specifications for a rifle range. Build only safe ranges!

Archery Range (outdoor). The field selected should be well away from the activity centers where people will not wander into the danger zone. Under no condition should a road or walk intersect the range. *The range, especially blind approaches, should be fenced on all sides and have warning signs where necessary.* If no natural embankment is available, this fence should run 35 to 40 yards behind the targets. It should be approached from the shooting line, with the targets at the more remote end of the field. Where it is possible, the direction of the flight should be north or northeast. This permits shooting at any time of day without the sun being in the eyes of the archers or instructors. It is more important, however, to change direction of the field to insure a safe backstop behind the targets and to make a safe approach.



Maine Development Commission

FIG. 30. OUTDOOR ARCHERY RANGE CONSTRUCTED FOR SAFETY

This archery range has been planned for complete safety. Note that it faces north, is fenced, and has adequate protection behind the targets.

The field should be reasonably level with a convenient rise of ground behind the targets to reduce the possibility of accident. If there is no natural hill which can be utilized as a backstop, a sodded embankment should be erected in a shallow arc behind the target line to stop arrows which overshoot. This should be 30 yards behind the targets and extend at least 30 yards to right and left of the outside targets. Targets should be placed at least 15 feet apart. The shooting line should be smooth, at least a yard wide, and filled in, if necessary, to provide a safe and steady stance for the archers.

Archery Range (indoor). *Indoors the targets should be surrounded by solid walls.* Windows and other vulnerable articles or facilities should not be within range of the arrows. All exits and entrances should be locked or blocked off while shooting is in progress. Care must be taken, however, not to violate fire-protection laws. No fire exits should be included in the target area. Even the balcony and running track should be made inaccessible to onlookers. Suitable backdrops must be provided to stop the arrows. (See page 325.)

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IX

SAFETY IN FALL SPORTS

Fall Sports Are Hazardous. EACH AUTUMN, thousands of ambitious young men entertain high hopes of making the football team. Many more thousands of enthusiastic spectators will go to see them perform. There can be little doubt that football is the king of school sports.

The hopes of many of these young men will be dashed upon the rock of injury; headlines will proclaim the possibility of stars not playing; fans will judge their team's chances of winning or losing by the number of players on the injured list.

At the same time thousands of other young men and women will be on the playing fields of other virile sports, but with far fewer spectators to cheer them on. Soccer, field hockey, touch football, and speedball are all hazardous sports, but they are not usually in the headlines. These dangerous games have been selected for fall participation probably because this season in the Temperate Zone is a snappy one, and youth returns to school after a summer vacation full of pep and ready for vigorous activity.

For all these thousands to play with a minimum of accidents and a maximum of fun and adventure, their schools must provide adequate facilities and equipment and the highest type of leadership.

FOOTBALL

Some form of football has been played by most early civilizations and in almost all countries. Usually it has been a rough game, the American version particularly. Its history in our

country has been a constant struggle to control its dangers and still retain the elements of manliness and risk involved.

Since World War II football again has taken its place as the most popular fall sport. There are approximately 50 million paid admissions each year, as many as 110,000 attending one game. Although baseball and basketball attract more spectators during a season, this is because there are many more games played. The average football season includes only nine games, whereas each big league team plays 150 baseball games and most school basketball fives play at least 18 games during a single season.

Each season produces its famous players. Many others would become famous were it not for the injuries which plague them. Such outstanding favorites as Pudge Heffelfinger, Jim Thorpe, Bronko Nagurski, Red Grange, Sammy Baugh, Ernie Nevers, Cal Hubbard, Don Hutson, Paul Davis, and Doc Blanchard had unusual ability to take punishment as well as to avoid injury or they could not have attained such prominence in this rugged sport. Coaches believe that the development of courage is one of the great benefits of football, and many feel the sport justified upon this basis alone.

Football Leads in Hazardousness. Football undoubtedly causes more deaths and injuries than any other school sport. On the college level, Eastwood found it to be the most hazardous, although Lloyd's study of high-school accidents on a national scale lists touch football and heavy apparatus as having a higher accident incidence, and these two sports plus wrestling as having a higher severity incidence. Most state and local studies, however, list football as the most dangerous of the sports. The author found that football led the accident list in every state athletic-benefit-fund report studied.

Danger Overemphasized. Because of the attendant publicity, the number of accidents and deaths in football tend to be overemphasized. Football is a tough and rugged game, but physical educators and school administrators generally agree that the benefits to be derived justify its existence. Although no injury or fatality can be taken lightly, they all must be con-

sidered in the light of the large numbers competing (600,000 high-school and 65,000 college players) and the nature of the game. Dr. Stevens, leader of the movement to make football a less hazardous sport, says:

> While there is a certain element of risk in football (or any strenuous athletic sport), the inherent dangers of football have been greatly exaggerated. The majority of coaches have never seen a football fatality, and such men as Mr. Stagg and Mr. Yost, who have been actively connected with football for half a century, have never seen a fatality due to the sport. Without a lengthy dissertation on the subject, it might be well to point out that in our experience it is definitely more dangerous to drive to the Yale Bowl as a spectator than it is to play football the entire season, as our accident rooms are frequented much more often by spectators than players. With many thousand automobile accidents every month, it is probably safer to keep our youth healthy on playing fields.[1]

Eastwood of Purdue, who has been the official statistician for football since 1932, verifies this statement by pointing out that: "Generally speaking, traffic fatalities for the ages 15–24 years for 1945 (*Accident Facts,* 1945, p. 27) are fourteen times greater (2,019) than the average high school football fatality rate per 100,000 players (1.48) for the past fourteen years."[2]

Forsythe made a study in Michigan, ". . . and the conclusion was that only one injury of any consequence was reported for each 1,000 to 1,100 playing hours during football practice and play in regular season. When this fact is kept in mind as compared with some nonathletic activities, it indicates that supervised football is not as hazardous as sometimes might be assumed."[3] It should be pointed out, too, that approximately 39 per cent of football fatalities have been among nonschool and college players.

Deaths Decreasing. Since 1931, the peak year for football fatalities, the death rate has been steadily decreasing, until

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[1] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps, Copyright 1933, by A. S. Barnes and Company, Inc. P. ix.

[2] *Fifteenth Annual Survey of Football Injuries,* American Football Coaches Association, Committee on Injuries and Fatalities, January, 1947.

[3] "Athletic Accident Benefit Plans," p. 140.

TABLE XX

FATALITIES DIRECTLY AND INDIRECTLY DUE TO FOOTBALL[4]

1931 - 1946*

	SANDLOT			CLUB			HIGH SCHOOL			COLLEGE			TOTAL	
Year	*Total*	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Direct*	*Indirect*
1931	18	10	8	3	3	0	20	10	10	8	8	0	31	18
1932	11	8	3	6	6	0	17	8	9	3	2	1	24	13
1933	15	8	7	4	4	0	19	10	9	5	2	3	24	19
1934	9	4	5	4	4	0	18	12	6	5	3	2	23	13
1935	10	4	6	7	7	0	25	14	11	5	3	2	28	19
1936	16	11	5	3	2	1	20	12	8	5	1	4	26	18
1937	6	3	3	4	4	0	19	13	6	2	0	2	20	11
1938	7	3	4	4	3	1	13	8	5	5	2	3	16	13
1939	2	1	1	1	1	0	10	6	4	4	3	1	11	6
1940	3	2	1	1	1	0	9	7	2	2	1	1	11	4
1941	5	5	0	4	3	1	9	6	3	0	0	0	14	4
1943	0	0	0	1	1	0	10	10	0	0	0	0	11	0
1944	6	5	1	2	2	0	10	9	1	1	1	0	17	2
1945	5	3	2	0	0	0	4	3	1	0	0	0	6	3
1946	5	1	4	5	5	0	13	13	0	2	2	0	21	4
Total	118	68	50	49	46	3	216	141	75	47	28	19	283	147
													Sum Total	430

*No study was made in 1942.

[4]*Fifteenth Annual Survey of Football Fatalities,* American Football Coaches' Association, Committee on Injuries and Fatalities, January, 1947.

during 1945 no fatalities were reported in college competition and only four among high-school players, as shown in Table XX compiled by Eastwood.

Accident Incidence. The national studies made by Lloyd and Eastwood indicate an accident incidence of 8.7 per 1,000 exposures among high-school players, and 87.9 per 1,000 among college players. Other studies indicate that the accident incidence of high-school football varies from 9 to 90 injuries per 1,000 exposures. The authors did not disclose the reasons for the great discrepancy between the college and high-school situation, but it would be logical to assume that the colleges maintain a better accident reporting system and that college competition is more intense.

Injuries. In Lloyd's and Eastwood's studies, the leg and foot area accounted for 43 per cent of all injuries, with the knee and ankle the parts most frequently injured. Sprains ranked first among the types of injuries, accounting for 56.2 per cent among college players and 53.4 per cent among high-school players. Strains were next, then bone injuries and wounds. (See Chapter II). According to Eastwood, the greatest number and highest severity of injuries to college players occurred during the early part of practice periods and games. In practice sessions 38 per cent of the accidents occurred during the first forty minutes, and in games 40 per cent occurred during the first twenty minutes, and the severity index was highest during the first ten minutes (11.2). Before this study it was generally believed that accidents occurred most frequently in the late practice or game periods. The authors interpret these facts to mean that players are insufficiently warmed-up, and they are of the opinion that accidents are also due to the tension caused by pregame pep talks. The 1946 season reports disclose, however, that most deaths occurred during the second and fourth periods. Similarly, it was found that 44 per cent of all football accidents and 56 per cent of absences took place before the competitive season started. They pointed out that a lower accident incidence results when a college has a three-week training period before the first interschool game and that definite evidence exists

that squad scrimmages in the first week of training raise the accident-incidence rate.

As would be expected, games are more dangerous than practice periods. Eastwood found that 47 per cent of all injuries in college football occurred during games, 39 per cent during scrimmages, and 11 per cent during squad practice of fundamentals. The activities that were engaged in when the injuries occurred were found by Lloyd and Eastwood to be:

TABLE XXI

Football Activities Engaged in When Injuries Occurred [5]

Element	*Percentage of Accidents*	*Severity Index*
Blocked	7	10.3
Tackled	6	8.7
Tackling	17	7.4
Blocking	18	7.2
Carrying the ball	11	6.2

The Wisconsin Study. In a six-year study (1930–1936) of 125,000 boys participating in football, basketball, and track, the following facts were revealed about football:

1. The forward pass was the most dangerous single play. 2. The first two minutes of the second half produced the most numerous as well as the most serious accidents. 3. The line plays produced the *fewest* injuries. 4. The tackler was injured more often than the tackled. 5. Pre-season injuries were unusually heavy. 6. In the age range of fourteen to nineteen, the fourteen-year-olds were twelve times as susceptible to injury as the nineteen-year-olds. The sixteen-year-olds eight times as susceptible as the nineteen-year-olds. 7. Sideline injuries were high and severe. 8. Whereas only 30 per cent of all play occurred within the 20-yard-line, 65 per cent of all injuries came in that area. 9. Injuries became more frequent toward the end of the season.[6]

The Medical Examination. Every player should have a thorough physical and medical examination before the season starts. Stevens and Phelps also advise a follow-up examination at the end of the season. They advocate that the football examination include:

[5] *Safety in Athletics,* p. 59.

[6] Neverman, "Sports for the Student," *Safety Education,* December, 1944, p. 127. Note the discrepancy between this and Lloyd and Eastwood's findings.

1. A detailed medical history, with particular emphasis on old injuries and past illnesses. 2. A routine examination of the different parts of the body. 3. A seven-foot plate of the heart and a stereoscopic X-ray of the chest. 4. Urine analysis. 5. A blood count and differential, which will prove of interest for future reference. 6. Special tests, such as vital capacity, the Schneider, and coordinating balance tests. 7. Postural examination.

They are of the opinion that the examination should be done by a physician experienced in this type of work, and advise that a boy turned down by one physician "corroborate this judgment by seeking the advice of one or two other well-qualified men, as in many cases boys who have been thus advised have remained inactive unnecessarily." [7]

Specific Administrative Controls

There can be little doubt that the football coach is the most important factor for the safety of the team. His attitude, experience, and training have a direct bearing on the accident incidence. Gone is the old-fashioned, hardboiled, tobacco-chewing town rowdy who browbeat the players and gloried in the brutalities of the game. In his stead is the school-trained and responsible coach who looks upon his profession as a lifetime task for producing better and healthier young men.

From the standpoint of safety, *the football coach should have had considerable playing experience* and at least four years' coaching experience; should be a qualified teacher of physical education, with either a major or minor; and preferably should teach some other sport or physical education classes. It has been observed that coaches who have not played the game tend to underestimate its potential dangers and experience a higher accident incidence; and that longer experience in coaching tends to lower the incidence. It is now an almost universal rule among state associations that only a regularly certified and full-time faculty member of a school may be an athletic coach.

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[7] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps. Copyright 1933, by A. S. Barnes and Company, Inc. P. 4.

When a poll was conducted by the author on this question, some coaches wondered how a coach would ever get started if four years' experience was required. It is understood, of course, that all school systems cannot be expected to conform to this high standard.

Sufficient Safety Equipment. After proper leadership, the next important safety factor is adequate and safe equipment and facilities. Although these provisions are discussed generally in Chapter VII, it is believed that football equipment merits mention here.

The purchase of equipment that will afford the best service and give the best protection to players is a major undertaking. To guide in its selection Miller advocated the following:

> 1. The garment should be reasonably comfortable in any temperature in which it is to be worn. 2. It should fit well, allow for freedom of movement, and give necessary support. 3. It should afford adequate protection against the hazards for which it is designed, and should not create additional hazards. 4. It should be durable. 5. It should be purchased from a reputable manufacturer.[8]

Danford questioned 250 school administrators regarding the difficulties they encountered in providing adequate protective equipment and supplies. Replies indicated that the only difficulty experienced was *lack of funds.*

Shain, Equipment Manager of the State University of Iowa, made the following recommendations with regard to the purchase of football equipment:

> 1. Plan your purchases to cover a two- or three-year period. 2. Do not make unnecessary changes in pattern nor put gadgets on pads unless you have tried them out in every particular and believe they are a definite improvement over the standard article. 3. Use conservative colors, especially in the lighter shades, unless you can afford to buy complete new uniforms each year and make a lot of replacements during the season. 4. If you are having trouble with your equipment, consult your salesman or manufacturer. 5. Gen-

[8] "Standards for Athletic Protective Equipment," *Safety Education,* September, 1941, p. 43.

erally speaking, so far as athletic equipment is concerned the old story of "getting what you pay for" holds true. If the representative of some small manufacturer calls on you offering merchandise at a much lower price, be careful.[9]

Because football is our most hazardous interschool game, special effort must be made to supply *sufficient protective equipment* of the best quality and greatest protective value to all players. This equipment should be properly fitted, maintained, and used. A school that cannot afford to provide adequate protective equipment for a football team should not sponsor the sport. Probably the most important piece of equipment for the football player, from the standpoint of preventing serious injury, is his headgear. The new type of lightweight composition headgear with the cradle straps has not proved satisfactory as hoped. Although it gives better protection to the wearer it probably is more dangerous to the opponent. The ideal headgear has not been developed to date. Hard, projecting noseguards on helmets should not be permitted, as they often become offensive weapons. It is strongly recommended that all players wear stockings, especially when the temperature drops below the comfortable playing range. They not only prevent many unnecessary abrasions and cuts but also keep the ankles, calves, and knees warm so that they are less subject to injury.

Following are some of the recent developments of protective equipment as outlined by Piper:

1. Improved construction of pads for shoulders and hips: light but strong, better fitting, and padded on the surfaces. 2. Thigh guards of bakelite and overlapping sponge-rubber knee pads that slip into pockets built into pants. 3. Locking devices which prevent cleats from backing off. 4. Elastic-webbed belts with leather at both ends, giving more "play" and keeping pants in close contact with shirt. 5. Helmets constructed with hammocks to keep the head from contact with the top surface. (A new type of helmet with a bakelite shell is being developed.) 6. Special types of protective

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[9] "Tips on Buying Football Equipment," *Journal of Health and Physical Education*. September, 1940, p. 426.

devices for the abdomen and other surfaces. 7. Improved types of knee braces made to individual measurements. 8. Protective blocking uniforms for "live" blocking practice.[10]

Danford made a recent survey of protective equipment in a number of Wisconsin schools and summarized the improvements needed:

1. Reconstruction of our football headguards based upon a study of the research on crash helmets made by the American and English Armies. Extend these in the back to protect the neck. [Such research was launched by the American Football Coaches Association and Football Rules Committee of The National Collegiate Athletic Association in 1947.] 2. A better hip pad is needed to insure greater protection of the hip joint and the base of the spine. 3. Improvement is needed in the thigh pad, providing for greater flexibility, yet giving adequate protection. 4. A nose guard should be used which protects the wearer but cannot serve as an offensive weapon. 5. Cover all shoulder, kidney, and rib pads as well as guards, with foam rubber. 6. Provide better protection for knees, elbows, and teeth. 7. Provide a better cleat and a cleat assembly that will not split or come unscrewed during use. 8. Cover all hard pads with at least $\frac{3}{8}$ inches of foam rubber.[11]

Sufficient blocking and tackling dummies should be provided and properly maintained. (See 1946 Fatality Report.) Although these devices are expensive and many administrators may feel that the cost is prohibitive, if they are considered in the light of the number of injuries avoided by cutting down "live bait" practice, there can be little doubt that the expense is justified. There are many fine types of dummies on the market that may be purchased. It is extremely important that these dummies do not become hard and heavy, which often happens when they are left outdoors. *Areas of sawdust or other suitable material should be provided for blocking and tackling*

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[10] "What Are the Recent Developments in Protective Equipment and Supplies for Athletic Participants?" Pre-Convention Conference on Safety Education, American Association for Health, Physical Education and Recreation. *Abstract of Proceedings.* Center for Safety Education, New York University, 1940, p. 10.

[11] *The Organization and Administration of a Program of Public School Safety Education.* Ed. D. Final Document, New York University, 1943.

practice. This provision is particularly desirable after the ground becomes frozen. The surface beneath the permanent tackling dummies should be of some suitable material.

Scheduling of Games. No other responsibility gives the coach more thought than the scheduling of games. Usually his chief concern is to win, and he endeavors to build his schedule accordingly. Since scheduling involves many problems of safety, it is recommended that the coach and administration think not only of safeguarding their own players, but also consider the safety of the opposing team by observing the following principles of scheduling:

Schools should schedule games with opponents of approximately the same playing standards and quality of personnel. 1. Small schools with weak teams should not schedule games with large schools with strong teams for early season warm-ups or for seasonal "breathers." 2. A team starting practice a week or more later than another should not meet that team until the former has had at least five weeks of practice and game contests. 3. Teams having special scholastic regulations and other restrictions, such as allowing only one hour of practice per day, should arrange to meet opponents sharing the same restrictions. 4. If the size of the squad permits, a junior varsity or lightweight team should compete with these players in order that teams may be of equal strength. Forsythe points out that scheduling should not be the responsibility of any one person and that some local board of control should be the final authority.

The Number of Games. The total number of games that it is desirable to play during a season is a moot question. From the safety viewpoint there can be little question that the fewer the games, the fewer accidents there will be. Forsythe, after studying the various state high-school athletic association rules, recommends six to eight games per season. He quotes Campbell and Reed as saying:

> The length of athletic schedules should be definitely limited. Boys participating in interschool athletics are under great mental and physical strain. This in itself is not bad; it is a test of the boys' stamina and moral fibre; it is a part of the man-building process

which we want. The objection arises, however, when the strain is too long continued. For this reason, boys should not be allowed to play excessively long schedules. Experience has shown that not more than four games should be scheduled for which the boys must put themselves on edge—games to be "pointed for." In addition to these games, three or four games of lesser importance might well be arranged. These games do not place the boys under a heavy mental strain and, therefore, do not interfere with the regular work of the classroom. Ordinarily, not more than eight interschool games should be scheduled, and the season should end well before the season for the next sport opens.[12]

New York State limits the number of football games per season to seven. Many states prohibit the so-called "postseason games."

High-school teams should play under high-school rules only. When they are necessary, local ground rules should supplement the standard rules. The National Federation High School Football Rules were first published in 1931, and now thirty-two states are playing under these rules. There is reason to believe that this adaption of the rules to high-school play has been instrumental in reducing football fatalities and injuries.

No interschool game should be played before the team has had at least *three weeks of practice.* Such states as Michigan, New York, Kansas, and Wisconsin have incorporated this provision in their State High School Athletic Association rules. Most colleges have always recognized this period as the minimum amount of time necessary to condition a team.

Spring Practice. Virtually all state high-school athletic associations have definite regulations prohibiting organized summer football practice or the use of pre-season training camps. Some college associations have similar regulations. Spring football practice is also losing favor. In fact, eighteen states have seen fit to outlaw it among the high schools and four others advise against it. Regardless of the arguments for or against such practices, from the safety standpoint it must be admitted that many injuries would be eliminated by its prohibition.

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[12] Campbell and Reed, *Coaching High School Athletics.* Los Angeles: C. C. Crawford, 1932, p. 162, as quoted in *The Administration of High School Athletics.*

Leadership and Skill Controls

Early Season Workouts. Before the extensive studies by Lloyd and Eastwood, it was generally believed that the number of accidents increased as the season wore on. They found, however, that 44 per cent of all football accidents and 56 per cent of the days lost occurred before the competitive season started. It should be recognized that approximately 44 per cent of the season's injuries occur *before the first game,* and steps should be taken to reduce the number and severity of accidents during this period. Since this period has proved to be responsible for so many of the season's accidents, the following special precautions are recommended, in addition to the usual safety procedures.

There should be no squad scrimmages until after at least one week of practice. The time necessary to condition different squads will vary with the local situation. This period of time, six days, is considered insufficient by some authorities, but even this short time is a far cry from the old-fashioned coach who tried to make his men tough the first night of practice by scrimmaging. The coaches polled by the writer were unanimous in agreement on this point.

There should be no "falling on the ball" until after the players have learned and practiced the techniques of proper falling. This fundamental was the season's opening drill of almost every coach for many, many years. It was gradually learned that this drill caused many unnecessary injuries, and it was not as important as it was formerly thought to be. At least two leading coaches who were questioned advocated its complete elimination. No rolling-blocking or blocking in the open should be permitted until after at least three days of practice. Because of the hazardousness of this fundamental, great care must be taken during the early season workouts. Some coaches advocate putting off open-field blocking until even a later date. No live tackling under game conditions should be permitted until after at least five days of practice. This provision may seem too severe to some, but consider the Pittsburgh Public Schools'

Football Committee's recommendations: "No tackling, either line or dummy, shall be permitted until after the fifth day of practice. If tackling 'under punts' is given at all, it shall be permitted only once a week and then only under the coach's personal direction." [13]

Wrist, arm, and hand injuries may be avoided by not using the arms to cushion a fall and by keeping them close to the body when the player is on the ground. The proper methods of falling can be taught. For this reason, some coaches require that their men take tumbling. Inexperienced players should not be allowed to choose or place their own protective equipment; the experienced trainer or coach should assume this responsibility. Often players carry over certain eccentric ideas from sandlot football and even from high school that are difficult to offset, but coaches in general should correct these misconceptions and assume responsibility for providing and placing proper protective equipment.

Warming-Up. When a player is properly warmed-up, he attains increased efficiency of action. This in turn provides better timing of muscle contraction, which reduces injuries and makes for better all-around play. On cold days more time is usually required, whereas on wet days it may be of shorter duration because of the expenditure of energy on soft grounds. Although each player requires a different amount of exercise to warm-up properly and every coach has his own special devices, the following general suggestions are made:

For warming-up and increasing strength and flexibility, *grass drills* are particularly valuable in avoiding injury or lessening severity. These drills are recommended because a proper warm-up requires sufficient stretching exercises and these can usually be best attained in this manner. It is usually better to utilize group drills than to leave each player to his own devices. Care must be taken to *keep the players warmed-up* by a continuous and varied program of activity during practice. It is a

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[13] Dr. Harry B. Burns and G. Lawrence Walsh, "Reducing the Number and Severity of Football Injuries," *Athletic Journal,* October, 1937, pp. 36–37, as quoted by Forsythe, *The Administration of High School Athletics.*

capable and intelligent coach who can keep his practice so well organized that players will not be allowed to cool off too often during a practice session. He must keep in mind that *all* players are not warmed-up because the ones he is working with are.

Practice Precautions. Coaches usually request their men to keep in condition during the summer months, but many circumstances interfere with these plans and the men usually return in different stages of physical condition. The coaching staff should be aware of the varying degrees of condition among the players at the beginning of the season and prescribe the proper amount and type of work for each individual. No work of a hazardous nature should be required of any player until he is in *proper condition* for the given activity. This is much easier said than done. The successful coach will judge the physical status of his men, however, and the more successful he is at this, the fewer accidents will mar the team's record.

For blocking and tackling practice, opponents should be matched carefully with the safety of the players in mind. Stevens agrees with this, saying:

> A wise coach will also see that in scrimmage he places men of nearly equal ability against one another. When, for instance, blocking a number one back and end against a tackle, none of the three would get worthwhile practice from the maneuver if the tackle were small and the other two men were large and of more experience and determination. . . . In live tackling practice, linemen, being poor tacklers, should tackle scrub backs and runners who are not too powerful or shifty. The backfield squad should tackle backfield men, and not have to tackle large, awkward linemen, as such conditions do not usually occur in a game. Owing to the fact that the ends run with the ball, they may tackle each other with safety and mutual benefit.[14]

The use of "live bait" for blocking and tackling practice should be minimized. Lloyd and Eastwood recommended that the tackling dummy be used instead. The new blocking suits may

[14] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps, Copyright 1933, by A. S. Barnes and Company, Inc. P. 16.

become popular and lessen the hazards of live blocking.

Ben Miller, Executive Secretary of the American Association for Health, Physical Education and Recreation, suggests that the use of live bait be eliminated except for official scrimmage or games. Pfortmiller of Colorado probably expresses the opinions of many coaches when he says that live bait tackling teaches contact as it will be found in the game and therefore minimizes the danger during play. Activity can be light at first and increased as time goes on. Practice on the dummy only may tend to increase game accidents. All will agree that the coach who views his second string men as "varsity fodder" is to be severely criticized. It is particularly important that these fundamentals be practiced early in the period before the players become tired and exhausted. With these viewpoints in mind it is recommended that:

Dummies should be used in blocking and tackling for all preliminary instruction, early season practice, and conditioning; whenever possible, instead of live bait. It must be remembered, of course, that severe injuries can also be received when dummies are used for practice. Blocking the dummy is a common cause of injury to the ribs. Adding to the impact of tackling by swinging the suspended dummy into the tackler is a dangerous method of practicing that some collarbones cannot withstand. The *sawdust pit* should be used as often as practicable for blocking and tackling practice. A practice area of sawdust or some similar material is particularly useful during inclement weather and will save many injuries if it is used when the ground is frozen. "Stay on your feet and drive" is a good safety axiom for a coach to use in teaching blocking and tackling. This coaching admonition is used by almost all coaches, but is mentioned here to remind coaches that it is also a valuable safety factor, at least for the one doing the blocking or tackling.

Scrimmage Precautions. Few problems plague the coach more than deciding upon the proper amount of scrimmage. One is safe in saying that during recent years there has been a trend toward less and less scrimmage, and that almost every coach uses less scrimmage as the season progresses. Scrimmage

should be limited on any one day to *not more than thirty minutes* for each player. Although it is recognized that a big, phlegmatic lineman can undoubtedly endure a longer scrimmage without tiring than a high-strung back, it is believed that such a general rule is advisable. No player should be allowed to participate in scrimmage without wearing *full protective equipment.* Often a player is allowed to go to the field without certain pads because he does not intend to get in and "rough it," only to find himself taking undue chances. *Scrimmages should be officiated* by competent persons other than the coaches. Since it is generally conceded that good officiating reduces the number of accidents, coaches should, whenever practicable, provide such protection during scrimmages. When the coach handles the officiating, it is usually neglected because he becomes absorbed in his coaching duties.

If a player wears removable teeth appliances, it is advisable to remove them for scrimmage or game play. The use of rubber teeth guards, similar to those used in boxing, has been advocated and may become popular. Following is a report of this development as recorded in the minutes of the National Federation of High School Athletic Associations Football Committee meeting in 1947:

> Attention was called to developments in perfecting a teeth guard which gives promise of being practical and which can be produced at small cost. The speaker exhibited a rubber teeth plate which can be molded to fit the teeth arrangement of each individual and which can be produced for a few cents in any school laboratory with average equipment. Since the guard is exactly fitted to the mouth of each individual, it does not unduly interfere with breathing and it does not give any appreciable discomfort.

Game Precautions. The reader is referred to Chapter III where the effect of game emotions is discussed. It should be realized that injuries are more frequent and severe during *the early part of the game,* and that this is probably due to insufficient warm-up and high tension caused by the pep talk. Before Lloyd and Eastwood's studies, it was generally believed that

the number of accidents increased as the game wore on. They showed rather conclusively, however, that the majority of the accidents and days lost were in the first twenty minutes of competition. Some coaches do not agree with these findings.

Under the rule which allows free substitution, there is every reason for a coach to remove a player from the game to determine whether or not he should be restricted from further play because of injury or fatigue. This rule has probably done more than any other single change in recent years to reduce the number of accidents during football games. Where there is only one coach, he should delegate some responsible person to observe the players for signs of fatigue or injury.

Dislocations and locked knees should be reduced by a physician or trainer, never by an inexperienced coach. A physician should be present for all football games. Dislocations can be very serious, and even the most experienced trainer should not be trusted to reduce certain ones. Stevens and Phelps remark, "It is obvious that a physician, no matter how well qualified or how wide his experience may be, cannot carry out a thorough physical examination upon the field of play."[15] They then go on to recommend the use of a stretcher to carry the player to a suitable place for diagnosis.

When a player suspects that a teammate has suffered a concussion, he should ask such a question as, "What is your name?" Inability to answer promptly and correctly is reason for immediate removal from the game. Headache and vomiting are usually diagnostic of a more severe concussion. It might be mentioned here that the opposing player who "picks on" such a player, or the quarterback who intentionally directs plays at an opponent disabled in any manner, proves himself to be a poor sport.

Blocking. Eastwood found blocking to be more dangerous (18 per cent) than being blocked (7 per cent), but being blocked produced more severe injuries, 10.3 compared to 7.2

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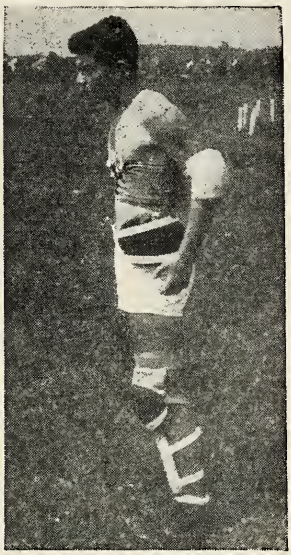
[15] *The Control of Football Injuries,* p. 19.

per cent. Following are several skill controls which are advocated to help reduce injuries in blocking.

At the time of contact in shoulder blocking, the head should be up, the neck "bulled," with the shoulders elevated, and elbows carried forward and sideward to give added strength to the shoulder. This position, with slight variations, is the accepted one for blocking and must be thoroughly mastered. In the body block the ribs should be protected by an arm, and the head should avoid hitting the opponent's knees or hips. This block, used most often in open field, is probably the most dangerous, and protective techniques must be learned if broken ribs and other injuries are to be avoided. Contact should be made against the *soft parts* of the opponent's body, not against the knees or hips. This admonition may be superfluous, because the blocker usually seeks a vulnerable part. As Coach Eliot of Illinois remarked, "For safety's sake yes, but it is not necessarily good technique. The best leverage comes from contact at the hips." *Blocking pads,* suspended from the shoulders, should be provided those players who are "injury prone" in the thorax area. Various types of blocking pads are on the market, and most coaches need not be reminded of the desirability for such protection to their players. The *standup* or "bother" block should be used whenever possible (usually on reverse plays for protecting the runner from the rear), because it is the least dangerous of the blocks. Professional players have popularized this type of block during recent years. Because these men must stay in the game, they have perfected many devices for self-protection that are being carried over into school and college games.

In blocking a kick, the hands and arms should be used to protect the face. It would seem unnecessary to include such a provision, but some men are so fearless that they forget to protect themselves, and the coach must teach this device, usually the crossing of the arms. Wallace Wade of Duke University teaches all linemen to block kicks in a safe and effective manner by having them practice the technique by "easy stages." The kicker toes the ball easily while a lineman *squats* and traps it

with forward extended hands. Then he has them charge to a given spot. The kicker stepping to the spot still kicks easily and they again trap the ball. Following these "easy" drills the



Scholastic Coach

FIG. 31. GOOD FOUNDATION PROTECTION

Such foundation padding as this insures the football player of the utmost in protection.

players learn to trap the ball at the given spot when kicked with full force. Coach Wade believes this method more efficient and safer than the usual one of leaping into the air with arms flying and midriff exposed, and he thinks it important enough to teach.

When he is being blocked, the player should use his hands freely, give with, or dodge, the main force of the blow, and try not to expose his midriff. Success in this fundamental makes a man not only less liable to injury, but also makes him a more effective defensive player. There are many such tricks of the trade that he will learn by experience as well as from his instructors.

Tackling. In the situations studied by Eastwood in

1932–33, only 17 per cent of all accidents occurred when the player was tackling, and 6 per cent when he was tackled. Eastwood's 1947 report however, says, "Defensive football is slowly becoming more hazardous than offensive football." Also, nearly one third of all fatalities during this season were due to tackling. In tackling the arms should be carried forward (over the head when crouched), because this position gives the shoulder added support and protection. This common sense precaution is one which the famous coach, Bob Zuppke, taught his many players and students at the University of Illinois during his twenty-eight years of active duty. The tackler's head should be kept up, should be close to the shoulders, and should be out of contact with the ball carrier's knees and hips. This is the general position, because it may not always be possible for the tackler to choose his position or point of contact. Stevens claims:

> Any method of teaching head-on tackles and head-on blocks is absolutely unnecessary, is dangerous, and makes for less efficiency in the game. . . . If the tackle is to be a straight-on tackle, the shoulder should crash into the runner's thigh pads at just about the top portion of his thigh guards, where the force of the tackler's blow and the drive from his legs would slide his shoulders up just above the pubis.[16]

After encircling the ball carrier's legs, the tackler should grasp his own wrist and roll with the ball carrier. By grasping his own wrist, the player is more likely to secure a firm grip and protect his hands. Often, of course, the tackler should not roll *with* the ball carrier, but should make the ball carrier roll *with him.*

It is not always necessary or advisable for the tackler to have his head in front of the ball carrier's body on a side tackle, because at times this exposes the neck to a dangerous lateral blow. (Some men can tackle with only one shoulder.) Many coaches insist upon the tackler's placing his head in front of the

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[16] From *Control of Football Injuries* by Marvin A. Stevens and W. M. Phelps, Copyright 1933, by A. S. Barnes and Company, Inc. P. 90.

ball carrier. As Stevens points out, ". . . this exposes the neck and cervical vertebrae to a lateral blow, such as the lifting of the ball carrier's knee." Shaughnessy says, ". . . there are some coaches who still send a tackler head-on into the ball carrier's stomach. They may get away with it once or twice, but sooner or later the other fellow's knee is going to come up to protect himself, and the would-be tackler is carried off the field." [17]

Tackling under punts or kickoffs should not be permitted until after at least *one week of practice* and should then be practiced no more than once a week. Tackling under these circumstances is at best a hazardous job. It poses the usual problem: Is it ultimately less dangerous to practice these fundamentals more often so that game situations can be taken "in stride," or to forego the hazardous practice and rely upon the stimulus of the game to protect the player? *The rolling or crossbody tackle should be used whenever possible.* This tackle should be made high. Stevens cautions, "The tackle should not be made low, that is, at the knees or at a point below the knees, or at any point where the ball carrier's leg can collide with the tackler's chin or neck."

Carrying the Ball. Lloyd and Eastwood report the following facts regarding ball carrying, as determined by their studies: Eleven per cent of all football accidents were incurred by players carrying the ball. Eight per cent occurred on off-tackle and end-run plays, and only 3 per cent during line-plunging. Accordingly, line-plunging accidents were found to be less numerous and severe than off-tackle and end-run. As would be expected, most injuries (53 per cent) occurred to the leg and foot, with the pelvis, thigh, shoulder, head, and neck accounting for about 10 per cent. The following precautions are recommended to help prevent injuries while the player is carrying the ball:

When he is tackled, a ball carrier should grasp the ball with both hands, keep his elbows close to his sides, draw in the shoulder to the side on which he falls, keep the chin well down

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[17] "Touchdown for Safety," *Safety Education*, October, 1943.

on the chest, draw the knees up to protect the abdomen, flex the spine, and roll on the heavy muscles covering the shoulder. He should twist and roll, give with the blow, and not extend an arm to the ground. This sounds like a big order, but once the correct methods have been taught the various actions become automatic to most backs. The more of these positions that are assumed, the safer the fall will ordinarily be. When a front fall cannot be transferred into a side-shoulder roll as described above, the falling player should strive for firm extension of the neck, back, and thighs, with some flexion of the knees. This gives a reverse curve, such as bridging in wrestling, and makes a rocker of the body. As suggested earlier, falls such as this can be practiced in tumbling classes. The ball carrier should endeavor not to fall directly on the ball with his stomach or ribs, which might knock the breath out of him or fracture his ribs, but should cradle the ball under the armpit or wrap himself around it. Most ball carriers learn early in their careers that falling directly on the ball is dangerous, especially if the tacklers pile on. Ball carriers should hold *the head up parallel with the trunk*. Carrying the head downward below the line of the rest of the spine is a very dangerous position. The head-down position has been advocated by many coaches when actually what they want is the *body* carried low.

The *fair catch* should be used as often as practicable, because it insures the safety of the punt receiver. The fair catch rule was placed in the general rules many years ago for the purpose of providing protection to the punt receiver. Coaches should train their men in, and encourage the use of, the fair catch when it is apparent that no ground can be made otherwise.

The forward passer must learn to avoid direct blows from the tacklers by using his free arm, faking and dodging, and learning the technique of proper falling. The forward passer is called upon to absorb a great deal of punishment during a game, and unless he becomes adroit at protecting himself he cannot last long. He must also have the help of officials and of his teammates.

Ball carriers should be encouraged to use the side lines

(run out of bounds) when they are cornered, as a defense against being injured. Some coaches do not agree with this technique. Coach Ray Eliot of Illinois does not believe it advisable "because the ball carrier has a tendency to relax while the tacklers keep coming with full steam." McNeely goes still further, saying: "I believe in playing the game for what it is worth and would hate to see my player run out of bounds just to avoid the possibility of being tackled. The same thing is true of a fair catch. Confidence in one's ability and knowledge of fundamentals, experience, good conditions, and good equipment should give the player faith in playing the game. Consciously trying to avoid injury may lead to restraint and inhibitions which at times are unsafe."

Touch Football

Touch football is generally the most hazardous of all high-school physical education activities. It is also a hazardous college activity. This is probably due to poor teaching and officiating, not playing according to the official rules, lack of conditioning, insufficient equipment, and inadequate facilities. A few additional precautions pertaining to touch football will be discussed here.

Special Precautions. 1. No one should be permitted to play in a touch ball game without first having gone through at least three practice sessions. 2. The number of players should be decreased to not more than seven, with only two players in the offensive backfield. 3. Without proper equipment, it is good practice to prohibit the use of any block which requires leaving the feet before contact.

A Safe Method of Touching. A safe method of touching in touch football has been developed by the Intramural Department of Texas A. and M. College.[18] They require each player to wear a canvas flag 36″ x 18″ tucked into the rear of his

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[18] C. G. White, "Flag Football," *N.E.A. Journal,* April, 1947, p. 294. This article gives a complete description of the game and rules as well as the method of touching.

gym pants which constitutes a touch when it is plucked by an opponent.

Field Hockey

Paradoxically, field hockey, a game considered originally by many to be too rough for men, has been adapted to the women's sports program and is now one of its most popular activities. Field hockey was first played in this country by a group of English women during the 1890's in Staten Island, New York, but it remained for Miss Constance M. K. Applebee, of the British College of Physical Education, here on a visit, to introduce the sport to the colleges of Wellesley, Radcliffe, Vassar, Smith, Mt. Holyoke, and Bryn Mawr. Philadelphia is the stronghold of field hockey. The United States Field Hockey Association, which has over 150 clubs and 350 schools and colleges as members, was formed there in 1922. The "World Series" is usually held there each year with the final game attracting over 10,000 spectators. Among the outstanding players have been Anne Townsend, Frances Elliott, and Barbara Stebeigh.

Third Most Hazardous College Sport. On the college level, hockey is classified by Eastwood as a very hazardous sport, ranking third in accidents.

Lloyd, Deaver, and Eastwood claim, "The most serious accidents are due to poor field surfacing, inadequate protection, unnecessary roughness, lack of training, and old injuries, all of which are preventable. The elimination of these hazards would result in 87 per cent reduction in field hockey accidents in high schools and 68 per cent reduction in colleges." [19]

Specific Administrative Controls

The playing surface should be of grass and should not be wet, frozen, or muddy. The playing surface should also be level and free from extraneous material. It is readily recognized that play cannot be restricted to ideal conditions only,

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[19] *Safety in Athletics,* p. 73.

and when it is necessary to play under adverse conditions, an effort should be made to compensate for the conditions.

Players should be required to wear *shin guards*. Special pads and shoes should be provided and worn by the goalie. Cleated sneakers are also desirable for safety and essential to skillful hockey playing. Natalie Smith, instructor of hockey at Wellesley, says that goal pads, kicking pads, and special shoes are absolutely essential for the protection of the goalie. Frances Elliott adds that the goalie should wear shoes with hard box toes and cleated soles, and that extra foot pads or "kickers" which must fit snugly over the shoes are equally important. She says: "The most practical 'kickers' are made of soft leather, with a padding of sponge rubber and felt over the inside of the instep. Overpadded kickers impede hard or accurate clears, and padding on the outside of the foot or over the heel is superfluous. A slice of ordinary rubber bath sponge about ⅜ of an inch thick, placed alongside the big toe under the sock, will soften a hard shot and improve kicking."

The goalkeeper should be warned against wearing a long or loose overcoat during play, for it may not only obstruct forward's attempting to shoot, but also may prove too bulky for her to carry out her duties safely.

Composition balls should not be used because they tend to rise in the air. The official rules do not permit the use of composition balls for matches, but during the war it was difficult to obtain regulation balls, and the wooden or composition balls came into considerable use for the practice of techniques. Although they seem to be more dangerous, it is questionable whether they should be barred from use in practice. Clarita Robertson, of the University of Illinois, says composition balls are essential for practice techniques but should not, of course, be used in a game. Balls should be kept well painted to provide greater visibility.

Goal and Stick Suggestions. Goal space should be covered with cord net instead of wire, because the rebound from the latter may be dangerous. The posts should be padded to a height of six feet. Sticks should have at least two rubber in-

serts and should not be used when they are splintered or cracked. When rubber grips wrinkle or slide down, they should be secured with waxed string and replaced with new grips where necessary. The player should not use a stick on which the tape is stringing off.

Officiating. Probably over 30 per cent of the rules of hockey are designed to safeguard the players. Therefore the ability and attitude of the official is of paramount importance. Only rated umpires should be used for interschool matches, and two should be provided when possible. "Coaches are urged to take advantage of this opportunity to create student officials. The umpiring committee is of the opinion that the development of an umpiring point of view among players and coaches will contribute to improved hockey, through better officiating and clearer understanding of the game." [20]

Specific Leadership and Skill Controls

In tackling, *the ball,* not the opponent, *should be played,* with the stick down and the body and stick away from the opponent. As in many other sports, the purpose of the game (to procure the ball) calls for hard, clean effort, and often the player who plays the opponent instead of the ball defeats her own purpose and may cause injury.

A follow-through on a drive should be make *with straight arms and wrists* so that the stick will not be carried above the waist. Although the rules allow the stick to go shoulder high, this precaution provides added security and, at the same time, good form. When the stick is not in play, it should be carried across the body with both hands. This simple precaution may prevent injury to another player. To prevent lifting the ball to dangerous heights, players should be coached not to lay the blade back when making a drive. In addition, a flick on a free hit may rise high enough to be dangerous, especially when the hit is taken at the edge of the striking circle and the attacking team is likely to rush in on it. In fact, any hard-lofted balls,

[20] U.S.F.H.A., National Umpiring Rules, *Official Field Hockey Guide.* New York: A. S. Barnes & Co. Inc., 1944–45, p. 62.

not necessarily undercut, and lofted hard shots at the goal are dangerous, contrary to the rules, and should be prohibited. *In fielding the ball with the hand, the fingers should be toward the ground.*

Hunting

According to figures issued by the Fish and Wildlife Service of the United States Department of Interior, more than 8 million Americans purchase hunting licenses each year. There are approximately 2 million more participants in trap, skeet, and target-shooting sports for which no license is necessary. These 10 million spend at least 650 million dollars annually on these sports. Firearms, ranging from the BB gun to the high caliber rifle, are dangerous weapons, yet almost the only qualification required for their purchase is that the purchaser be of legal age; and one need have only the usual small fee to be licensed to use guns. So far no attempt has been made by the various states to issue licenses on the basis of one's knowledge or skill in using these dangerous weapons.

Death Rate High Among Adolescents. Nearly 3,000 deaths are caused each year by firearms. Only one third of these are attributed to hunting accidents, but approximately 1,200 others are killed in the home, either preparing for, or cleaning up after, hunting. As might be expected, the fifteen to twenty-four-year age group experiences the most accidental deaths, accounting for nearly 800. The five to fourteen age group ranks second with approximately 600, less than 50 per cent of which are due to hunting accidents (over 50 per cent to home accident). Most accidental deaths from firearms are among the male population; only about 13 per cent are among females. Nearly 50 per cent occur between October and January. The return of thousands of war veterans with souvenir firearms has greatly increased the accident incidence from this source. Veterans are required by law to register these firearms, but only their good judgment in handling such weapons can save the lives of innocent examiners or even of the veterans themselves.

Travelers Insurance Co.

(*a*) *Proper Method of Getting Through Fence.* Alone, reach through the fence and lay your gun on the other side, before climbing over. If with others, one of the party should go through first, leaving his gun behind. All the guns can then be passed over to him.

Travelers Insurance Co.

(*b*) *Unload Guns Before Carrying in Vehicle.* Be sure that your guns are unloaded before getting into the car. A road bump or an excited dog may cause a loaded gun to be discharged. Eject every shell; never carry loaded guns in an automobile.

FIG. 32. HANDLE WITH CARE

Travelers Insurance Co.

(c) If first in line, don't carry your gun over your shoulder. If last in line, don't carry your gun pointing forward. Best practice is for the men to walk side by side.

Travelers Insurance Co.

(d) Although walking in single file is not recommended, it sometimes is necessary. Be sure that the gun is not pointed at a companion. This picture shows a safe method of carrying guns.

FIG. 32. *c & d Proper Methods of Carrying Guns*

Factors Contributing to Firearm Accidents

Approximately 45 per cent of the wounds incurred by hunters afield are accidentally self-inflicted. Most of these occur when a gun is accidentally discharged because the hunter fails to remove the ammunition or place the safety catch on before he: 1. climbs through or over a fence or up a tree, 2. crawls through underbrush, 3. slips or falls, 4. places hunting equipment in, or removes it from, a vehicle, 5. rests a gun against a tree, wall, or fence and it falls, 6. rests a gun against an object or on the ground, and an animal accidentally "pulls the trigger." Shooting by a hunting companion accounts for about 36 per cent of the accidents. The gun is fired sometimes at another person because of: 1. inexperience and lack of skill, 2. overeagerness and excitement, 3. mistaken identity which may be due to defective vision, 4. carelessness, 5. drinking alcohol. Fourteen per cent of the fatally wounded are killed by parties other than their own. The causes may be any of those listed above plus a lack of knowledge of the deadliness of the weapon which causes the novice hunter to: 1. underestimate the carrying power of the bullet and the spread of the shell, 2. step into the line of fire, 3. handle the gun improperly because of an inadequate knowledge of the game hunted, the terrain, and hunters' etiquette, 4. ricochet a bullet from water, rocks, or other hard surfaces into another or himself, 5. use a gun unsuited for the enterprise or one with a faulty mechanism.

Schools Do Not Teach Gunmanship. Since hunting has more participants than any other sport in America, except fishing, many persons are critical of the school and college physical education curricula because instruction in this dangerous but healthful and enjoyable sport is not given. Very few progressive schools have "dared" to offer instruction in that sport activity in which one of the largest percentage of students will eventually participate. Many, of course, do provide target practice which may be a very helpful method of teaching students to use guns safely. *It is recommended that every school provide some instruction in the safe use of firearms.* This in-

struction can range from the memorization of safety slogans to the learning of manipulative skills. Even though it is not possible to maintain rifle and pistol ranges for actual practice in most schools, it is usually possible for the instructors to stress the importance of safety in hunting and to demonstrate the safe methods of handling firearms.

Specific Administrative Controls

Among the schools or camps offering target practice there are a few administrative controls that should be observed. It is recommended that those safety rules used on National Rifle Association ranges be utilized. There has never been a fatality on a range sponsored by this organization.

The target range should be so constructed that there is little or no possibility of shooting others, especially those not participating in the sport. The indoor range is usually so constructed that there is little danger of shooting a non-participant, but it may lack the devices necessary to eliminate the danger among participants. Such devices as the "return target," bullet-proof partitions between shooters, and safe gun stands should be included. Outdoor ranges should be so located and constructed as to avoid the danger to others, to target markers, and to participants. *Care must be taken to use only cartridges which are designed for the given gun.* One should not experiment with unknown shells. The proper types are designated on the shells and guns but when the user is not absolutely certain, he should inquire of experts about the advisability of using another type. The order of shooting and scoring should be so organized as to minimize the danger among participants. When a return-target system is not provided, all participants must be instructed to finish shooting and lay down guns before one person collects the targets.

Leadership and Skill Controls

There are certain skill controls for the safe handling of guns that should be mastered by all users. Probably the most important is that *a gun should always be handled as though it*

were loaded and should never be pointed at one's self or another person. By observing this simple rule most deaths and injuries could be avoided. Young people must be taught this rule because many of them have played at "cops and robbers" with toy guns until the promiscuous pointing of a real gun is only natural. Scarcely a month passes that it is not reported in the news that a person was killed accidentally by a gun that "wasn't loaded." *A gun should be loaded only when the hunter is in the field.* As soon as he is out of the range of game, the gun should be unloaded. Certainly, a loaded hunting gun should never be carried in an automobile, or boat, or kept indoors. Likewise, *the safety latch should be on at all times* when hunting except when the hunter is about to shoot. This precaution may prevent the inexperienced or excited hunter from shooting at the quarry occasionally when he fails to release the safety latch, but once the habit is established the custom will prevent accidental discharge and fast firing at none too clearly defined objectives.

A gun should be carried with *the muzzle pointed either up or down,* preferably up, either resting on the shoulder or at "port arms" in military fashion. When hunters are in single file, the guns should be carried as shown in Fig. 32. If carried "through the arm" with the muzzle pointed down, a gun may be dangerous to companions, but if it is carried in either of the up positions an accidental discharge will usually fire harmlessly into the air. When the hunter is going through thick underbrush, his hand should be cupped over the trigger so that it cannot be discharged by a twig. *One should be sure that the muzzle of the gun is free from mud and snow at all times.* If it is fired with the muzzle clogged, the gun may explode. When it is necessary for the hunter to climb a fence, the gun should be put through muzzle first, and placed sidewise on the ground, the muzzle clearing the ground but not pointing up. After the fence is passed, the gun should be picked up.

Before firing a gun every user should be thoroughly trained in the skills of manipulation and dry firing. This entails the proper assembly and care of the gun as well as the actual firing.

Good instructors train their pupils thoroughly in dry firing before allowing them to fire at the targets. The same procedure should be followed for the novice hunter. It is certainly unwise to allow a person to go hunting before he has mastered the skills of gun-handling or obtained a knowledge of the dangers involved. For generations hunting has perpetuated itself through the apprenticeship system. Father teaches son, and son teaches his companions. This system has not been too scientific because each instructor is liable to pass on his bad as well as his good habits. It is therefore recommended that *one choose as a companion a mature, experienced, and thoroughly grounded hunter.* It is usually unwise to hunt with more than one companion, and more than one novice should never be present. Nor is it advisable for a person to hunt alone. Each hunter should keep in constant touch with his companions and try not to "get in front"; in other words, he should be sure to keep out of the line of fire. It is best to walk side by side. It is recommended that all hunters wear the customary deer-hunter's red cap or jacket which serves as a protective device against being mistaken for game.

When hunting from a boat or near water, the hunter must observe fundamental safety precautions governing the safe use of boats. These controls are discussed under Camping in Chapter XIII. One of the most hazardous practices should be mentioned here, and that is the very dangerous practice of wearing rubber boots in a boat. It is an unusual swimmer who can overcome this handicap when he is precipitated into the water.

A person should never shoot through underbrush at a moving object unless his hunting companion is at his side and it is evident that the moving object is game. Of course *no one should ever shoot over a companion,* who may stand up suddenly and be the victim of a very foolhardy action. Shooting too near another's ear may cause deafness.

While it is not actually in use during target, trap, or skeet shooting, the firearm should be kept unloaded or the breach open. There is probably no safer firearm activity than the conducted trap and skeet shoots or rifle and pistol contests because

every marksman is an expert who thoroughly understands the safe operation and the accepted best etiquette of gun handling. It is the "backyard" beginners that must learn these safety precautions.

Soccer

Soccer, a truly international game, is more popular in this country as a school and college class and intramural activity than as a varsity sport. It is estimated that approximately 546,000 boys and girls play soccer on the high-school level, whereas colleges have about 133,000 participants.

In spite of the bodily contact involved in this sport, soccer was found by Lloyd and Eastwood to be a mildly hazardous sport among high-school participants and college women, but highly hazardous among college men.

Specific Administrative Controls

Cleated shoes with reinforced toes (rubber for girls) should be worn by *all or none* in physical education class games and in intramural and interschool contests. There is a general agreement among instructors that the regular basketball shoes are most practical for use by members of physical education classes. Low sneakers should not be worn in soccer, and high shoes should be laced tightly to support the ankle. Leather cleats become detached from the boots easily and may cause injuries to the feet and ankles because of the resulting unequal bearing surface created. Likewise there is a danger to other players when nails are exposed by worn bars on the soles of soccer boots. Some interscholastic soccer leagues require the official to inspect boots at the start of a game and again at half-time.

A laceless ball is the most desirable type to use. The laced ball, especially when wet and heavy, may cause injury during attempts at heading and loose lace ends endanger the eyes. When teams are playing during wet weather or on wet grounds, a dry ball should be exchanged for the wet ball when conditions warrant such action.

Shin guards should be worn by all players at all times when

cleated leather shoes are used. Such guards may be advisable for all play, regardless of the style of shoes worn, especially among girl players or those who have bruised shins. A *soft-ball* should be used when rubber-soled shoes are worn, also for practicing heading. A soccer ball can become quite hard and heavy after exposure to the elements, if it is not given proper care.

Specific Leadership and Skill Controls

The instep or sides of the foot, and not the toe, should be used for kicking. Of course, there are kicks which require the use of the toe, but for class work especially, the above precaution is advised. In other words, it depends on the type of kick. The weight of the body should not be placed on the foot used to trap the ball, or the foot placed on the top of the ball. Skill, particularly in kicking and dribbling, will lessen the number of injuries.

In heading, the ball should be watched until the last possible instant before contact is made. The ball should be played by that part of the head near the hair line and with an impetus supplied by the neck muscles. The head should be drawn back in a direction opposite to that in which it is desired to direct the ball and then brought forward to "hit" the ball. A player should not head a low ball because another may kick at it at the same time. It is quite safe to say that when a player attempts to head a low ball, he is indicating a deficiency in soccer skills. The low ball may be played from a position to the side of the player, in which case the ball is met with the instep or the side of the foot, or it may be played from a position directly in front of the player. In the latter case the ball may be played off the chest or it may be played by kneeing, in which case the ball is struck just above the knee.

The ball, not the player, should be played in tackling. Although this seems the most obvious procedure when viewed from the standpoint of safety as well as strategy, the reverse is often the case in practice. Players exhibiting a tendency to play the man rather than the ball indicate a need for more intensive training in tackling. Correct technique should be

acquired first in non-game situations, and the action speeded up only as the player improves in skill and confidence. *Players should tackle with a reach,* not run in too close to opponent, as bodily contact is apt to result. An effective maneuver for the tackler, particularly in a head-on situation, is to drop to one knee and extend the opposite foot in such a manner as to block the ball with the sole of his foot. Obviously, the timing must be right, if it is executed too soon the opponent may dribble by the tackler. The purpose of this move is to cause the offensive player to lose control of the ball so that it may be recovered by the tackler or a teammate. This maneuver will prevent head-on collisions and is an effective method of tackling.

In dribbling, the head and eyes should be *kept up* as much as possible to avoid collision. Skill in dribbling calls for something in addition to propelling the ball. The expert dribbler, by making use of his peripheral vision, maintains control of the ball, and also knows the location of his nearest opponents and teammates, so that he may take appropriate action when indicated. In securing the ball, the goalkeeper should use whatever technique is most effective commensurate with safety. Too frequently goalkeepers exhibit a tendency to get possession of the ball before attempting to get it away from the goal area. This is a highly desirable practice when time permits but may result in unnecessary injury when the onrushing offensive players are forcing the play. When the play is close, the goalkeeper should play the ball immediately rather than attempt to gain possession.

Girls should keep arms folded across chest when blocking the ball with upper trunk or head. It is not advisable for girls to allow the soccer ball to hit their unprotected breasts.

Speedball

Since speedball is a combination of football, basketball, and soccer skills, the safety controls obtaining in those sports should be adapted to the coaching and playing of this particular sport. Lloyd and Eastwood found speedball to be in the hazardous group on the secondary level, with an incidence of 2.4

accidents per 1,000 exposures. Among college women it was found to be highly hazardous, with an incidence of 5.6, whereas among college men it rated among the low-hazard sports. In speedball the types of injuries, parts injured, and causes of accidents could well be expected to be those associated with football, basketball, and soccer.

Elmer D. Mitchell, who developed the game, advocates the following safety precautions in addition to those of other sports as mentioned above. "Piping should be flush with ground and flags should be in rubber hoses so they will fall over when hit. Among the rules advised for safety is the one of not kicking a flying ball."

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X

SAFETY IN INDOOR WINTER SPORTS

Winter Sports Are Mildly Hazardous. In most sections of the country, the majority of winter activities are carried on indoors. Indoor areas naturally present added dangers because of the limited space and other restrictions growing out of problems of construction. Despite this fact, most indoor winter sports are not very hazardous. This may be because the originators of several of our indoor games, being aware of the restrictions, made provision for them, as well as because the present leaders also recognize and compensate for the hazards of indoor play.

Only wrestling and apparatus, among the indoor winter sports discussed in this chapter, are classified as hazardous. Very few coaches and instructors of these two activities would admit that they are dangerous, and they are not if conducted under proper safety controls.

Basketball, the game with more players than any other school sport, is not a very hazardous sport. Although it is responsible for more injuries than any other sport except football, its accident incidence is low. The remaining sports—badminton, fencing, handball, ice hockey, volleyball, calisthenics, games and relays—are all relatively safe. Each, however, requires its own peculiar safety controls if it is to remain safe.

Apparatus and Tumbling

Heavy apparatus, introduced into this country from Germany in the last century, has been decreasing steadily in popu-

larity during the last few years, especially among high schools. The expense of the apparatus and lack of trained instructors have been responsible in many cases for its neglect. Wettstone, gymnastics coach at Pennsylvania State, however, says: "Gymnastics and heavy apparatus activities have been out of use in many high schools because virtually no safety methods were practiced and injuries were naturally quite prevalent. Erroneously and unfortunately, gymnastics instead of poor safety methods was jettisoned." [1] In spite of this, it has been estimated that there are approximately 98,000 high-school participants.

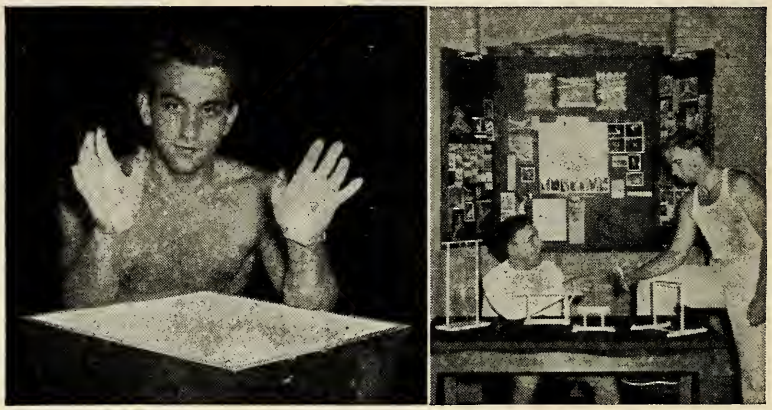

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FIG. 33. A NOVEL METHOD OF COACHING

Left: In gymnastics, hand guards help reduce possibility of blisters. Right: Miniature apparatus makes it easy to give students a vivid mental picture of the correct way to perform a stunt. The apparatus need not be elaborate. Apparatus and stick figures may be made by students. Coach Wettstone of Penn State uses this novel method of teaching the various apparatus stunts.

Teaching Safety by Miniature Figures. For the teaching of gymnastics, Wettstone recommends the use of "pipecleaner men" and miniature apparatus. He says, "Correct interpretation or demonstration of a skill on the part of the coach is as

[1] "Safety Devices in Gymnastics," *Journal of Health and Physical Education*, February, 1941, p. 98.

much a safety measure in gymnastics as good mats, nets, and belts." Blackboard diagrams, moving pictures, and photographs are also useful in this connection. Novices should be warned that good performers make difficult stunts look easy and that they must not try these stunts until they are pronounced ready for them by the instructor.

Specific Administrative Controls

There should be *sufficient mats,* carefully placed, for apparatus and tumbling stunts. Cutout mats are recommended for covering dangerous bases. If small mats are used for series tumbling, they should be tied together. The principle of not promoting those activities for which adequate equipment cannot be provided, applies particularly to apparatus. Even though sufficient mats are available, participants are often reluctant to secure and place them properly. The side horse should have mats on all four sides, and those for the horizontal bar should be as wide as the bar is long. A mat 10 by 30 feet with holes for the uprights is excellent protection for the horizontal bar, and four or five 5 by 10 feet mats, set sideways and tied, will cover the area for parallel bars. Care must be taken to cover the center area. The rings require five or six mats which should be doubled at the dismount end. Tumbling mats should be doubled when skills are being learned to reduce the likelihood of shin splints and to encourage performers to practice the more advanced skills.

Hand and ceiling belts should be provided and used where possible in all stunts where there is an element of danger. Instructors and coaches insist upon the frequent and proper use of these invaluable aids. A common error in handling the hand belt is to grip the rope too far from the belt. Wettstone says, "One hand should grip the rope near the belt, or at least be ready to slide up when the time comes for the concentrated effort on the part of those holding the belt." Ceiling belts have been used successfully with the following apparatus: horizontal and parallel bars, springboard, and teeterboard. They can also be utilized for tumbling and circus stunts. The com-

mon error in their use is to give support too soon and with too much pull. Wettstone says:

> The proper position of the ropes is important, and this can be determined by having the performer execute a movement in slow motion from the starting position. For example, when attempting a back somersault on the parallel bars, one should have the ropes extending from the belt, under the arm pit in front and up over the shoulders to the ceiling.[2]

A canvas net approximately 9 by 12 feet, if used properly, proves an effective safety device for advanced stunts on the flying rings and high bar. Coach Wettstone has developed a safety net of this type that is being widely copied. He claims that such a device lends itself well to dismounts where ceiling and hand belts are not adaptable, and when dismounts are preceded by one or a series of stunts. It also allows performance without the hindrance of ropes or belts. Wettstone warns that unless properly used it is not worth while, and gives the following pointers:

> 1. Be sure that the individual is ready for this advanced dismount. 2. Hold the net so that it covers the area extending outward from directly under the bar. 3. Each man assisting should hold two straps, one with either hand. 4. Hold the net about two feet from the mats, higher at the farthest end and lower at the end underneath the bar. 5. Have the performer first feel the security and safety of the device by having him take a short, intermediate swing with a "seater." 6. As the individual lands in the net, the supporters should be leaning back slightly to prevent the sudden force from pulling them forward and into the net. 7. The end men are the key men, since they must guard from overthrows which result in the performer's falling close to the bar or in the early release which gives distance to the fly. 8. Do not use the net sparingly; keep using it until the skill is mastered, and then keep spotting when the net is not used.[3]

Sealskin, pigskin, or lampwick *handguards* and gymnastic chalk should be available to protect the hand and to insure a

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[2] "Safety Devices in Gymnastics," p. 121.
[3] *Ibid.*, p. 100.

good grip on the apparatus. Coaches and individual performers vary in their preferences, but most of them are agreed that some protection for the hand and assurance of a good grip is needed. *Safe spacing between apparatus and tumbling lines should be maintained.* Those schools that are fortunate enough to have several pieces of the same apparatus will have to observe this precaution. If adequate supervision cannot be provided between classes, the apparatus should be put away or covered with mats so that it cannot be used. A great many acci-

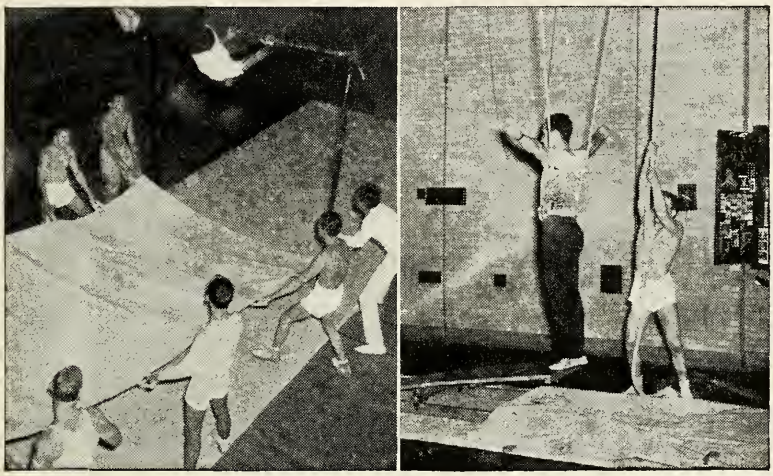

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FIG. 34. MECHANICAL METHODS OF SAFEGUARDING

Left: A safety net is a valuable aid in the successful learning of many difficult skills and dismounts from the horizontal bars and rings. Right: Ceiling belts help in learning individual tumbling and circus stunts such as are practiced from the springboard and the teeterboard.

dents occur because unsupervised students attempt stunts beyond their abilities. Large schools have found it advisable either to put the apparatus away each time, or to cover it with mats to prevent usage.

Specific Leadership and Skill Controls

An atmosphere of confidence, through the strict observance of safety rules and regulations, should permeate the instruction

and performance. Here, again, the possibility of overemphasis on safety, which may lead to fear and consequently to more accidents, exists. No other activity of the school program requires more rigid observance of safety rules, but, at the same time, a sensible balance between daring and caution must be struck. An atmosphere of confidence can be instilled only through a scarcity of injuries. Horizontal and parallel bars should not be raised or lowered *except by permission of the instructor,* who should check to see that they are securely locked when changed.

Spotting. Since a large percentage of accidents in apparatus and tumbling can be avoided by proper assistance, the following spotting precautions are elaborated upon. They were taken largely from Coach Hartley Price's article [4] and were approved by the experts polled. The reader is referred to Chapter VI, where the teaching of progressive skills, conditioning, avoidance of fatigue, and other general provisions that apply to avoidance of accidents in all sports are discussed.

1. One or more spotters should be provided for beginners at all times and for others when there is an element of danger. 2. Spotters should be carefully trained in the proper techniques of assisting and safeguarding. 3. The instructor should analyze the mechanics of the stunt, spot the danger zone, and place the spotters accordingly. 4. Proper progression in spotting includes: (*a*) working in the safety belt until the gymnast has acquired a "muscle feel" of the stunt; (*b*) assisting by tapping, pushing, lifting, or supporting the performer; (*c*) assuming a position of readiness, but giving no support until necessary; (*d*) enlisting the confidence of the learner by making him think you are holding him, but not actually doing so. 5. Safety hints in spotting include: (*a*) protection of the performer as the primary consideration; (*b*) being ready for instant action and aware of every movement; (*c*) being close to the performer without inspiring his movements; (*d*) gauging position by the space required for execution and the point where performer is most

[4] "The Art of Guarding or Spotting," *Journal of Health and Physical Education,* March, 1937.

likely to lose grip; (*e*) keeping hands at side rather than in outstretched position, so that any apparent nervousness may not carry over to the performer. (Twenty per cent of those polled disagreed with the last-mentioned technique. Coach Loken of Michigan expressed the opinion of the others by saying: "If spotter keeps arms out ready for action, it gives the performer a better sense of being protected and gives the spotter a look of being ready for action."); (*f*) performer need not be caught; check fall by protecting his head and shoulders; (*g*) spotter should give with the falling performer if he cannot meet him at the top of his fall. 6. The performer should never change his mind in the middle of the stunt, but always follow through. 7. Performers must be made aware of the challenging character of tumbling and apparatus stunts, cognizant of their own limitations and admonished to rely upon the instructor's judgment in attempting more advanced stunts. 8. Correct methods of falling (break-fall) should be taught. These would include the learning of the proper degree and places of relaxation and tension; the proper use of the arms and legs to reduce the momentum of the falling body; cushioning the fall with the other parts of the body; making use of "rolling"; falling forward, if possible, by turning the head; keeping fingers pointed forward and chin on chest when falling backward; keeping chin to the side when falling forward.

Side Horse. 1. Spotter should be on far side for vaults, such as squat, straddle, and back straddle. (Coach Bergman of Senn High School, Chicago, says: "I use the near-arm pull and outer-crotch lift on near leg to carry him over.") 2. On front, flank, and rear vaults, the spotter should grasp the biceps and wrist of the supporting arm of the performer. 3. On thief vaults, there should be a spotter on either side of the horse. 4. On back straddle vault, there should be two spotters, one on each side and just back of the spot where the vaulter will light. 5. On quadruple and triple rear vaults, the spotters must keep at a distance and then step in to prevent a fall in case the legs do not clear.

Long Horse. 1. Spotter must be ready to lift on chest if it

appears the vaulter may hit the end of the horse. 2. In learning to vault, the beginner should progress in accordance with his ability, and take care not to catch hands under thighs. 3. When the beat board is used, it should be kept at a uniformly safe distance (about twelve inches from the horse).

High Bar. 1. The correct grasp for most stunts is to "follow the thumbs." 2. Progression should be made from the low bar, chest high, to the high bar. 3. Two spotters are required for beginners and three or more for advanced work. 4. For giant swing, spotters should be directly under bar, and at the side (front) where the learner is most likely to lose his grip. He

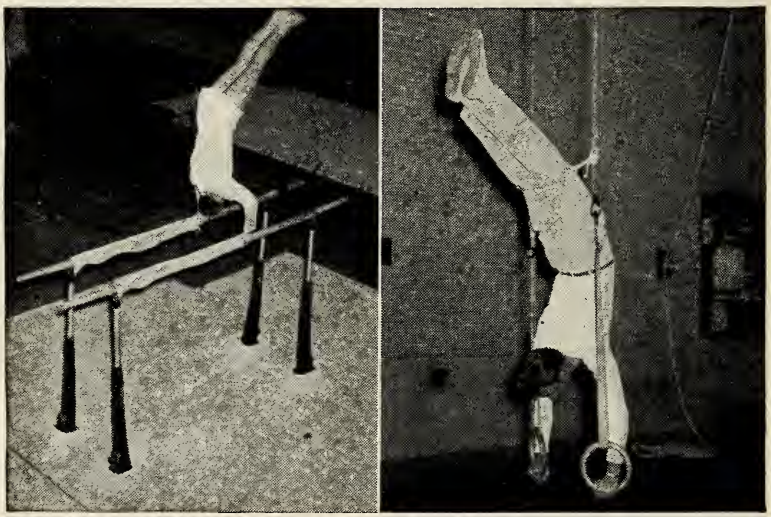

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FIG. 35. SAFETY FOR BEGINNERS

Left: With cut-out mats on the floor and two strips of heavy sponge rubber serving as pads on the bars, this beginner is guarded against injury. Right: Cross straps on rings, supporting body at knees, lessen the fear of falling backward and help student concentrate on the stunt.

should hang on even if he does not go over the top. As he drops, two of the spotters should tackle him by the waist, thus stopping him before his grasp is most likely to break. 5. All

difficult stunts, such as the front, back, and side flyaways, the sheep vault over the bar, and the back somersault, should be tried first in the safety belt. Spotters should be used to prevent the performer from striking the guylines. 6. In a trick such as the angel swing to a giant, two men should be placed behind the bar because it is the danger point. 7. If performer is suspended by the knees, the spotter or teacher should hold the feet and regulate movement by pressure on the chest.

Flying Rings. 1. Two spotters should be used to guard the performer on stationary rings. 2. A minimum of three spotters should be used for all advanced swinging stunts. 3. Rings can be lowered to about two feet from the floor to practice shoulder or handstands. (Several coaches objected to this technique. Franklin, of Indiana University, expressed the general dissent by saying: "I prefer teaching a forward roll from shoulder and handstand, since this is what must be done in performance. Practice should be as nearly like the total situation as possible. If performer becomes accustomed to turning off to floor from two feet, he will tend to turn off and release grip from six feet. I have the same objection to the following item, the use of a rope or strap across the ropes.") 4. A rope or strap should be fastened between ropes to prevent falling from shoulder or handstands. 5. Overspinning must be guarded against by straightening out on attempted dismounts. 6. For a flyaway the beginner should be placed in a hand-safety belt.

Parallel Bars. 1. Bars can be covered part way by heavy sponge rubber, held by canvas covering, to protect the performer's fall. 2. Spotter must refrain from putting arms over bars, always spotting from below the bars. 3. When performer is in support position above the bars, the spotter should steady him by holding his wrist and elbow. 4. When performer is swinging in a support position, the spotter should have one hand in front of him and push against his chest if he falls forward, and one hand behind in case he falls backward. 5. To help a student on a forward or backward roll, the spotter should put one hand on the nape of the neck to prevent a fall, while he uses the other to assist him with the roll. 6. When student

tries a hand balance for the first time, a ten-foot mat should be placed across the bars, so if he overbalances he can merely do a forward roll onto the mat. 7. For advanced stunts like the back somersault to a support, stoop vault over the far bar, etc., the safety belt must be used. 8. For stunts like the back somersault below the bars to a support above the bars, three spotters, each kneeling on one knee, are needed. One man should watch the chest in case he falls forward; another, on the opposite side of the bar, should guard him in case he overspins and his feet miss the floor; the third should be located in front to protect him so that he does not hit the metal uprights.

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FIG. 36. AIDS TO SAFE TUMBLING

Left: The hand belt—another aid to safe tumbling. The rope should be gripped near the belt so that too much slack will not be allowed. Right: "Spotting" is an extremely important procedure in gymnastics.

Climbing Ropes and Poles. 1. Performers should be encouraged not to climb beyond their safe limits. 2. The next performer should not stand at the lower end of the rope or pole because the climber may fall. A spotter should. 3. Climber should descend slowly, hand under hand and with legs clamped tight, to avoid burning the hands, especially during the last few feet of descent where there is a tendency to relax the grip.

Tumbling. 1. Lead-up balance activities should be taught before tumbling stunts are attempted. Tumbling over groups is dangerous and should only be done by the proficient. 2. Spotters should be used in all stunts by beginners. 3. The dive-and-roll is a dangerous stunt and the following precautions should be taken: squat balance and forward roll should be thoroughly mastered first; the body should traverse an arc rather than a straight line parallel to the floor, the head kept up, the arms straight on landing, and the feet back; the performers should not be permitted to dive too high or too far. 4. Almost all of the stunts of advanced tumbling should be tried first in the hand or ceiling safety belt. 5. Spotters holding rope on a series of back handsprings (flip-flops) should keep slightly ahead of the performer. 6. In case of a back somersault, the spotters must push up on the shoulders to be sure that the performer gets his head completely around. (Franklin recommends spot on buttocks as being most effective.) 7. For a back handspring, the spotter should see that the performer keeps his hips high. 8. For stunts like the tinsion or baroni, a piece of muslin about 6 by 5 feet may be used. The spotter should wind the muslin about the waist of the performer and hold the two ends together as he follows him down the mat.

Doubles, Triples and Hand-to-Hand Balancing. 1. The top man should always be guarded on pitching somersaults that are performed in a backward or forward position. As the gymnast turns the somersault, he should be watched closely so that he does not overspin. If the top man is falling from a considerable height, the spotter should not attempt to catch him, but should safeguard his head and shoulders from injury. 2. Four spotters should be used in difficult triple tricks. 5. When doing double pitches, the two throwers should act as spotters even after the trick (layout back or full-twisting back) has been mastered. 4. It is unwise to allow beginners to try pitch-back somersaults for the first time without the use of the safety belt. 5. For almost all of the combined tricks in hand-to-hand balancing, two spotters should be used.

Badminton

Badminton, which calls for high speed, great agility, and often considerable endurance, is considered a relatively safe game. So far as is known no study has been made of the injuries that occur in the game, but from observation it would appear that the majority are strains and sprains caused by starting or stopping suddenly, and face contusions or wounds caused by a player hitting another with the racquet in doubles. The game's increasing popularity makes it advisable for instructors to recognize the hazardous situations which may arise.

Specific Controls

The game must be adjusted to the clearance provided around the court. Although it is not often that one is required to run off the court, many courts are placed in restricted areas that require adjustment on the part of players. Because the game appears so "easy," many neglect a proper warm-up. It is therefore called to the attention that a proper warm-up period must be emphasized to loosen up arm, shoulder, and leg muscles, to prevent injury, strains, and sprains. A jacket or sweater should be worn, and a definite increase in body temperature felt.

When doubles are played, the method of coverage should be thoroughly understood; it is better to let the opponent's return go rather than strike one's partner. Although the badminton racquet is extremely light, it travels at great speed and can inflict considerable pain. It is particularly dangerous to wear glasses when playing in a doubles match. When one's bird goes on an adjoining court, the occupants of that court should be warned and permission obtained before retrieving the bird. This courtesy not only insures the safety of the competitors, but also contributes to the sportsmanship of the game. A woman playing in mixed doubles should protect her face with her racquet when a smash is indicated, as allowed by the rules.

Basketball

The originator of basketball, Dr. James A. Naismith, told the writer in 1926: "It was our intention to develop a noncontact game which could be played safely indoors." Although basketball has become much more of a contact game than Dr. Naismith apparently intended, it is not a very hazardous activity. Many of his original thirteen rules posted on the bulletin board at Springfield Y.M.C.A. College in 1891 are still in the game.

"Basketball, popular from the night it was introduced, was played in more than seventy-five countries before the outbreak of the war. It has more players than any other comparative or combative sports (about 20 million throughout the world), and in the United States it once had the distinction of drawing more admissions than any other contest." [5] It has been estimated that there are over a million high-school players of the game, and at least 499,000 college players.

Causes of Injuries. Lloyd and Eastwood list in order of rank the causes of basketball accidents—61 per cent of which could be eliminated among high-school students, 42 per cent among college men, and 77 per cent among college women:

1. Colliding with other players
2. Being struck by play equipment
3. Collision with extraneous objects
4. Slipping on the floor
5. Twisting an ankle or knee
6. Unnecessary roughness
7. Poor physical condition
8. Improper personal equipment
9. Tripping over play equipment

Specific Administrative Controls

Foot blisters are often the bane of a basketball coach's existence. Special precautions must be taken if they are to be

[5] Frank G. Menke, *Encyclopedia of Sports*, p. 131.

prevented among players. Two pairs of socks should be worn, the inner pair of cotton, preferably of light weight such as track socks, the outer pair of best quality heavy wool. This reduces friction because the cotton hose cling to the foot and the rubbing occurs between the two pairs. Feet can be hardened by painting them with a skin-toughening compound and dusting with zinc stearate before and after practice. After practice and before painting, they can be soaked in tannic acid solution. Socks should be changed daily, especially during early season training when the above processes are in vogue.

Well-fitted shoes with the best *rubber* soles should be worn. Shoes are probably the most vital equipment of the player, in so far as safety is concerned. Only the finest quality should be provided for varsity players, and members of physical education classes should be encouraged to use good quality shoes. Shoes should be kept properly laced at all times. Playing in street shoes or stocking feet is dangerous and should never be permitted. Even where the enthusiastic student volunteers to play without shoes, he should not be allowed to if accidents are to be avoided. Pete Butler, successful Colorado State College coach, makes the following suggestions about basketball shoes: "The coach should carefully fit shoes on his players as many of the boys do not know how to fit themselves properly. Many high school boys come to college with their feet wrecked from playing in poor quality and ill-fitting shoes. I believe that the most important items are: 1. A good fit with at least a half inch of free toe space at the end. 2. A nonslip sole. 3. A canvas upper rather than leather. (Leather stretches; the animal pores clog with waste products from perspiration and thus eliminate ventilation qualities.) 4. A sponge cushion insole in order to absorb the shock of driving from and lighting on a hard floor. 5. A loose lining. 6. A good heel counter, smooth and free from stitching in the middle of the heel, in order to avoid unnecessary friction and the resulting blisters."

The wrapping or taping of ankles for intramural and interschool games to prevent injury is controversial among coaches and teachers. See page 180 for a discussion of this question.

The use of knee guards is similarly disputed. Homer Allen claims that there is no evidence that knee guards cut down knee injuries, which occur more from twists than from falls, but others feel that the protection against abrasions justifies their use. Some coaches believe that their use depends upon the style of play used, claiming that such protection makes the player more likely to scramble for the ball on the floor. From the safety standpoint there can be little doubt of their value in preventing abrasions. Basketball pants should contain small *hip pads* for protection of the hip bones.

Officiating, especially in classes and intramurals, should be close. This recommendation does not, of course, mean that interschool games should not be similarly officiated, but it is intended to emphasize the fact that laxity in class and intramural games is too often tolerated. Instructors in general agree that the non-varsity player is entitled to as much protection while he is competing as is the varsity player, but find it difficult to provide competent officials for these contests. It is recommended that student leaders be especially trained for this task, as outlined in Chapter V.

Distance from the side lines to the wall or bleachers should be *at least six feet.* Walls closer than this should be covered with protective mats. The space available for basketball, particularly among high schools, is often too small, and the areas surrounding the court are insufficient.

The large number of arm and hand injuries in high schools are probably due to attempts to protect one's self from collision with objects along the side lines, and even on the floor. Add to this the hazard of slippery and poorly-maintained floors, and one has a picture representing criminal neglect on the part of many institutions sponsoring and promoting this sport.[6]

The distance from the end line to wall, backboard supports, or bleachers should be at least eight feet, and if shorter,

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[6] Lloyd, Deaver, and Eastwood, *Safety in Athletics,* pp. 86–7.

the obstacle should be covered with protective mats. This will allow a run-through distance from the goal to the wall of twelve feet. If during games the bleachers are closer than this and are filled with spectators, the hazard is not so great, but mats will be needed during practice. There should be an open space of at least twelve feet between the bleachers behind the basket. (See Chapter VIII). Bleacher corners and other obstructions should be covered with *protective mats* during practice of varsity teams and class games. It is suggested that each period, before play begins, team managers and class leaders be assigned the responsibility of removing extraneous apparatus and materials from the floor and covering with mats those that cannot be removed.

The scorers' table and the teams' benches should be placed in safe positions where they will not interfere with the playing space. Unless there is sufficient space, extra benches for the players or scoring tables should not be placed between the bleachers and the playing floor. The customary practice of reserving space on the front two or three rows for these purposes is usually the most satisfactory arrangement. From the standpoint of safety and efficiency it is desirable to place all extra benches and scoring tables on the same side of the gymnasium.

Limiting the Number of Games. The problem of limiting the number of interschool contests during a single season has caused extensive discussion and considerable disagreement among school administrators. The trend in most states is toward curtailing the number of games played by high-school teams. Just how many games can be played varies according to different State Association regulations. Indiana, one of the most liberal states, limits the number to twenty and allows participation in two tournaments in addition to the state tournament. New York has one of the most stringent rules, limiting the season to fifteen games, exclusive of sectional games. Michigan limits the regular season games to fourteen if the school sponsors football, and to seventeen if football is not sponsored. (See page 108.)

Specific Leadership and Skill Controls

Adolph Rupp, famous University of Kentucky coach, says that his principal method of preventing injuries is through *conditioning.* "We believe that fewer accidents and injuries occur when the players are in good physical condition and we spend a great deal of time and study on getting every man into tip-top shape. Then we bend every effort to keep them that way. Psychology plays a major role in this process."

In complex footwork specific fundamental drills are essential for safety. There are many drills in pivoting, guarding, and ball handling that the average coach employs to teach his men agility in moving, all of which form the basis for safety as a concomitant of efficiency. Instructors are urged to employ similar drills in training members of the physical education classes.

In guarding, the player should keep his feet on the floor and his center of gravity as low as possible to prevent injury. It is readily recognized that there are occasions when a guard must leave his feet, but this admonition is listed as a guiding principle, particularly for inexperienced players. The hands and arms should be used as much as the rules permit to avoid collision with another player. Although the rules do not permit such use of the hands, it is an accepted practice on the part of players and officials and is probably justified when such action would prevent injury. *The head should be kept up, in dribbling, to chart the course.* For many years, this precaution has been considered proper technique by most coaches, but the difficulty of mastering it, or insufficient practice, has left many players inept. Because this method of dribbling provides for safe "navigation" besides enhancing the dribbler's efficiency, it is recommended that coaches and instructors spend more time in teaching this skill.

Balance should be retained in making run-in shots. Most accidents seem to occur under the basket. This is only natural because this area is a congested one, and usually a team wins or loses there. Because it is the danger zone, every precaution

Acme Photos

FIG. 37. THIS IS NO ACCIDENT!

Most accidents occur under the baskets. Although these players were tangled up considerably, no one was injured.

should be taken to teach players the proper methods of protecting themselves in this area. Retaining one's balance when shooting run-in shots is one of these important skills. Some

coaches believe that the feet of the player should be kept together, and others advocate spreading the legs, but whichever method is used, only constant practice in maintaining balance will help reduce dangers inherent in this vital shot. When under the basket, a player must learn to protect himself by "spreading out" and jumping at the proper time. It is difficult to describe the various techniques employed by adept players to protect themselves from injury under the basket; each must learn from experience. Coaches in general are agreed that emphasis in this instance, as in most others, should be placed on the positive method of teaching proper skills, rather than emphasizing the negative "don't do this or you'll get hurt" method.

Girls' Play. *Girls should play only under girls' basketball rules.* In many sections of the country the girls play under boys' rules, and their coaches report satisfactory results. Most women coaches and instructors will admit, however, that the boys' game is more rugged and that the girls' game is much safer. Girls should fold arms across chest when blocking. Blocking, of course, is a foul in girls' basketball, as in men's, but this precaution is suggested for protection when contact is impossible to avoid. When this is impractical, it is recommended that they turn the back or use the hands. Adolescent girls should be permitted to participate *moderately* during menstrual period.[1] Among the persons queried there was general agreement on this point. It was pointed out by some that the word "moderately" carries various connotations for different instructors. All agree, however, that participation should be prohibited upon a physician's recommendation.

Boxing

The desirability of including boxing in the school or college physical education program is debatable. Those who object to sponsoring the event base their argument upon two premises: first, that the purpose of boxing (to injure one's opponent) is contrary to educational objectives, and second, that it is too dangerous. Despite the fact that various studies indicate the accident incidence to be very low in high school and

only moderately hazardous in college, certain physiologists and physicians claim "hidden" damage, in the form of pin-point hemorrhages, following the breaking of the little blood vessels which cause the destruction of a small amount of surrounding brain tissue. This condition, known as being "punch drunk," has long been regarded as a by-product of professional boxing.

It is not the purpose of this discussion, however, to settle the issue of the sport's desirability, but rather to urge those who do promote boxing to endeavor to make it a safer, and thereby more popular, activity. As always, the best starting point is the physical examination. The medical examination for boxing should be aimed specifically at the dangers involved. Boxing is undesirable in such conditions as anemia, thyroid disturbances, myopia, and glaucoma. Although this point is stressed in Chapter V, it is important enough to be mentioned here: special care must be taken to match boxers of equal weight and ability.

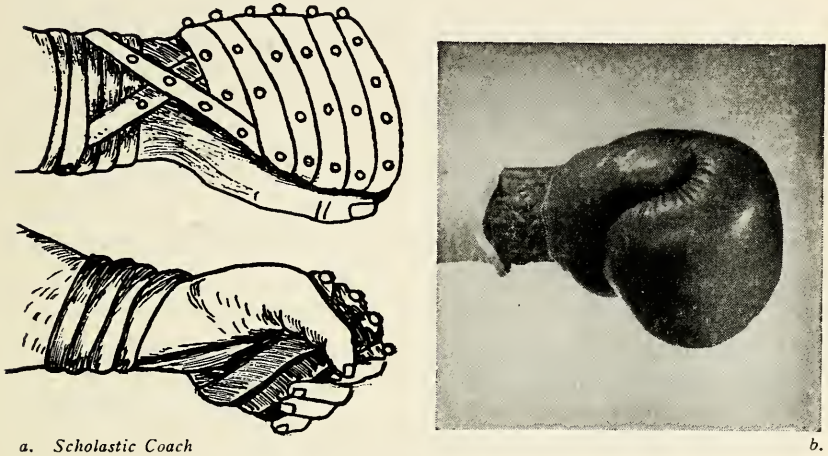
Injuries. The most common injuries, in order of rank, are bone injuries of the head and face (usually teeth), wounds of the head and face, and sprains of the arm and hand. These results would indicate more stringent precautions in protecting the head and face, where approximately 85 per cent of the blows are aimed by amateurs.

Specific Administrative Controls

A school that cannot provide good leadership and adequate equipment should not promote or permit boxing. This is particularly true of this sport because of its potential dangers. Above all, the coach or instructor must have had sufficient experience and training in school boxing to insure intelligent handling. John J. Walsh, famous University of Wisconsin coach, says, "I have often stressed the point that unless the sport of boxing can be carried on properly it should not be attempted. The same statement, of course, holds true of all sports." Special rules should be adopted to safeguard interscholastic boxers. The bout should be stopped when even a minor cut or injury occurs. Also, when a boy is knocked

down, he should be required to take a 9 count, then if there is any question about his being dazed at the count of 9, the bout should be stopped. Other rules regarding weight reducing, medical examinations, pre-bout inspection, and safe equipment should be included.

Boxing contests should be conducted on a suitable mat, preferably with standard ring. By boxing contests is meant the



a. Scholastic Coach *b.*

FIG. 38. BOXING, THEN AND NOW

The Roman Gladiator wrapped his hands like (*a*). The modern boxer uses this modern type of boxing glove (*b*) which has the thumb tip attached to the fore part of the glove, thus preventing many thumb injuries. There are no laces, which is another safety advantage.

regular competition of the usual three rounds. The ring is desirable, but the mat surface is indispensable. The padded floor of the ring should extend at least three feet beyond the ropes. For group boxing, the entire area should be covered. Fourteen-ounce gloves should be used in the 132-pound class and over; twelve-ounce, below this weight. They should be evenly padded, with no tears, and the laces tied and tucked in. Most coaches and instructors believe that very little damage can be inflicted by the use of fourteen-ounce gloves; however, it is important that even these large gloves be free from lumps,

with the bulk of the padding centered over the striking surface, and the gloves should not be broken in the region of the knuckles. Danford says: "Insist on use of gloves with thumbs laced to palm. A glove should be manufactured with the thumbs a part of the main section of the glove." (See Fig. 38.) Gloves with elastic wrist bands are more desirable than the laced type. *Cup protectors and rubber teeth guards* should be used by contestants in interschool and intramural bouts. It usually is not possible and probably not desirable to furnish these protective devices to participants in physical education, except in advanced college classes where the sport is more skillfully practiced. Proper headgear should be provided for all contestants for practice purposes. Although this provision pertains primarily to varsity squad practice, if striking above the shoulders is permitted in physical education class work, it is strongly recommended that participants be provided with headguards.

Boxing gloves should *not* be provided for enemies who wish to settle a grudge. Such a practice involves the philosophy of the conduct of the physical education program. Those who favor settling grudges in this manner figure that it is better to have the boys fight fairly, under supervision, when there would be less danger of serious injury, than to allow them to fight it out under less auspicious conditions. On the other hand, it is argued that such differences of opinion should be settled like civilized gentlemen around the conference table, and that the department should not sponsor fighting. Only 25 per cent of the coaches queried on this point believed that gloves *should* be furnished. Similarly, gloves should not be left around and available for unsupervised use.

Blindfold boxing, group elimination, and other such dangerous mass-boxing events *should not be allowed.* This brutal type of activity is not tolerated by the average instructor, but often pressure to provide entertainment during gym shows and other activities is so great, and the boys so adventurous and courageous, that such travesties on the physical education program are permitted.

Leadership and Skill Controls

Making weight by sweating, drying out, dieting, and violent exercise should be prohibited. As pointed out by Law, some boys, under doctors' supervision, need to reduce. This rule, however, is aimed at the pernicious practice among some victory-hungry coaches of requiring certain boys to reduce sufficiently to make the weight one class lower than that in which they would normally compete.

Not allowing class participants to *hit above the shoulders* is a controversial safety issue. Fifty-three per cent of the instructors questioned by the investigator believed participants should be allowed to. Ellis pointed out that it was permissible if headgear were provided, and McNeely remarked: "It is my observation that boys cannot always hold back and will inadvertently punch to the head, and his opponent may not then be prepared to parry or block." On the other hand, many instructors believe that most of the objection to boxing can be eliminated by following this restriction. It should be pointed out that during the war it was not uncommon for commanding officers to enforce this rule as a precaution against injuring vital sense organs. Participants must be taught to box, not to slug. This fundamental is difficult to teach and even more difficult to enforce, but if serious injuries are to be avoided, it must be taught.

The musculature of the wrist and hand, especially extensors, should be built up with special exercises. The large number of hand and wrist injuries indicate a need for provisions beyond the learning of proper skills, and special exercises may be the answer. The use of the various mechanical devices made for this purpose is recommended.

When he is taking a punch, the boxer must give *with* the blow. This method of softening the blow has always been a trick of boxing and is mentioned here only because it is such an important precaution. Bouts should be stopped too soon rather than too late. The instructor and coach in class or team boxing must assume this responsibility, and only referees who

"lean in this direction" should be used to officiate in interschool matches.

Additional Suggestions. Hints such as "Guard Up!" "On Balance!" "Eyes Open!" and "Roll with the blow" must constantly be used in coaching and teaching boxing. A new hand wrap should be provided which will prevent knuckle abrasions and infections. The ones used now are inferior and cause irritation of the skin.

Calisthenics

Calisthenics are probably the safest of the physical education activities. They are used primarily as a warming-up and conditioning device for both physical education classes and athletics. They are, however, extremely useful for developmental and remedial purposes. Instructors and coaches usually develop their own set of exercises which they believe to be the key to proper warming-up, but they are advised to weigh carefully the value of each exercise in the light of scientific fact. Mainly because of poor leadership, such exercises are seldom found interesting by students, but are usually tolerated as a necessary evil. Most coaches feel, however, that their proper use reduces greatly the number of injuries. When they are employed in remedial work, special attention must be given to avoid injuring handicapped persons.

Reducing by Calisthenics. Persons who take up calisthenics to reduce weight, especially "on their own," will usually be disappointed. Reducing through such means requires more time and energy than the average person can stand or is willing to give. Steinhaus claims that to burn up one pound of body fat (4,320 cal, or 1¼ lbs. of body weight) would require that one devote at least ten and one-half hours to continuous freehand exercise. Or if he chose he could lose the same amount by doing 5,714 push-ups from the floor, walking 66½ miles at seventeen minutes per mile, laundering for about 22 hours, or walking 48 times to the top of Washington Monument! It is easy to see that, for the majority, losing weight through exercise is impractical and may be dangerous. The only hope for the

majority is to stop eating more calories than they can possibly burn. Young or middle-aged persons who *want* to reduce through exercise (and proper diet) should consult a physician. If he finds them organically sound and prescribes it, then they should join a scientifically conducted gym class.

Specific Controls

The general controls of Chapter V, such as provision for sufficient space for each student, splinter-free floors, and progressive conditioning, will usually eliminate the majority of the hazards of this activity. The following specific controls should, however, be utilized:

Calisthenic lessons should be scientifically *progressive,* which should eliminate most of the inherent dangers. All of the famous systems of calisthenics—the Swedish, Danish, and German—emphasize this point, that the lesson should proceed from the less strenuous to the more strenuous exercises for each part of the body, tapering off at the end. When hand apparatus is used, special precautions must be taken to prevent participants from striking one another. Such apparatus does not hold much favor in the modern program, but where it is used instructors must be aware of the particular dangers of swinging Indian clubs, dumbbells, and similar equipment. Steel wands are especially dangerous, and sufficient space should be provided and special rules of conduct adhered to if accidents are to be avoided.

Lessons should be spaced close enough together to avoid stiffness and to make progression successful and safe. Overexertion, especially during strength and endurance tests, should be avoided. The students are often so stiff and sore following calisthenics that they come to despise them. The wise instructor will plan the activity so as to minimize these dangers and discomforts.

The value of calisthenic drills before breakfast has been questioned. Not many schools have occasion to require them at this time, but some summer camps do. When the armed services required that vigorous calisthenics be given before

breakfast, they found as a result that many were injured by fainting and falling.

Group Games and Relays

Group games and relays form the basis for many elementary-school physical education programs and are used extensively on other levels. The degree of hazard varies according to the character of each game and relay. Because there are so many different kinds, it is impossible to point out the dangers of each. Instead, the general hazards of the various types of games and relays will be mentioned.

Special Controls

Games and relays should be used which can be conducted safely in the given space. There is such a large variety of activities to select from in this category that there is little excuse for using those which would be unsafe in the given facilities. Such relays as the jump stick and wheelbarrow and three-legged relays are dangerous. The wise and capable instructor will experiment with many different kinds and use those which prove to be most accident-free for the various groups taught and facilities available. Teachers should never hesitate to modify the game or change its rules if greater safety can be attained. Many authors of books on games and relays give cautions on the various dangers of each activity.

Collision is the chief source of injury in games and relays, and the teacher must plan and conduct them to avoid this danger. Although collision between participants may be considered one of the risks of the game, certainly collision with objects such as trees, walls, and apparatus need not be considered inevitable hazards. The usual rule of keeping to the right should be applied to all shuttle relay passing. Running games should *not* be conducted in the regular classroom. This regulation is debatable. Some school systems prohibit the use of running games and relays in the classroom on the ground that the children should be out of doors for such activity and not annoy-

ing other classes within the building. Under certain circumstances—say, in a section of the country where weather conditions are unusually bad and where no gymnasium or sheltered space is available—it may be justifiable to conduct those activities in the classroom, provided they are carefully supervised. The younger the group (not below primary grade), the safer it will be to conduct games in the classroom, because they are less likely to overexert and can withstand bumps and falls better than older children.

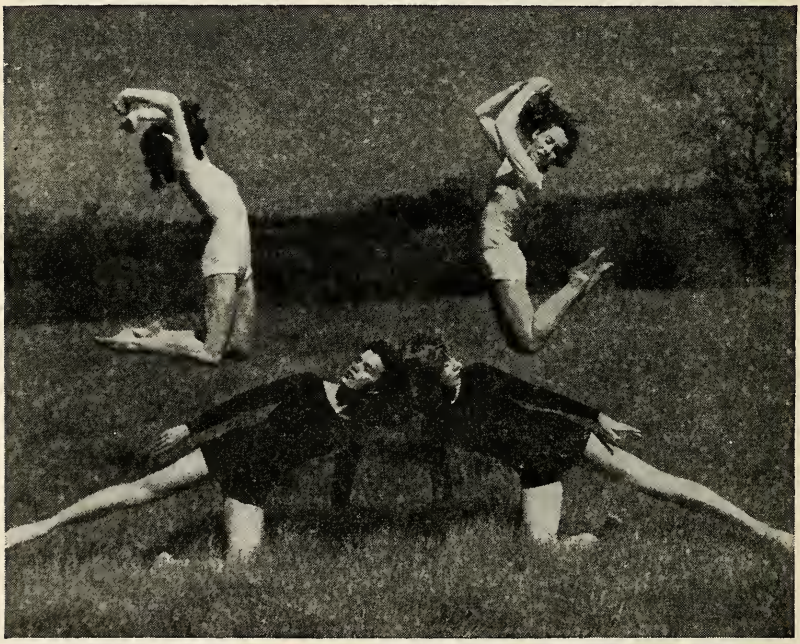
Miriam Anderson of Northern Illinois State Teachers College, who has had very long experience in this field, believes that if they are properly conducted, some games and relays can be used safely in the classroom.

Participants in games requiring "beating" should be restrained, and the beaters used should be of a lightweight noninjurious material. Some youngsters exhibit a sadistic tendency in such games and must be curbed. Harold Jack of the Virginia Department of Education, claims that this type of game should not be employed, but the general opinion seems to be that such activities provide a proper outlet for the children's normal play expressions. It should be mentioned here, too, that the proper location of the beating—the buttocks—should be designated and strictly adhered to.

Such dangerous games as blindfold and group-elimination boxing, shoe fights (where all shoes are mixed in a pile and contestants fight to retrieve their own), and group wrestling should be eliminated from the program. Such activities do not possess sufficient values to counterbalance their hazardousness, and therefore should not be a part of the modern physical education program. It is understood, of course, that on the lower levels some of these games are not dangerous if they are conducted properly, and they may be used successfully. Professor Staley, University of Illinois authority in this field warns, "Our program should not be soft. These activities can be conducted safely under good supervision."

The spaces between shuttle relay teams should be large

enough to prevent collision, and the finish line should never be the wall or too close to it. These two simple safeguards will guarantee the elimination of many accidents in the staging of relay races and should be observed at all times. There is absolutely no excuse for a trained physical educator's permitting the use of a wall as the touch line. Shuttle relays should never have backward running, jumping, and hopping in both directions, because of the danger of collision, back to back. The backward running is particularly dangerous when it is allowed in both directions. In using relays of this type it is also necessary to let the condition of the ground or floor determine the type of relay. Animal-type relays carried on where cinders or glass are present are dangerous.



University of Kentucky

FIG. 39. THE DANCE IS STRENUOUS

Modern dance is one of the most strenuous of the dances. Proper conditioning and expert teaching are most important in avoiding unnecessary injury.

Dancing

Although dancing is one of the most strenuous of activities, it is relatively safe because it does not involve collision on the part of participants nor the use of dangerous implements and is usually conducted on smooth surfaces. It is, of course, largely a feminine activity in the physical education program, but most college curricula for the preparation of physical education teachers of both sexes include courses in the dance. Since dancing forms the basis of many girls' physical education programs, it would be well to determine carefully the causes of injuries and the best methods of avoiding them. Lloyd and Eastwood's study, which treated dancing as a whole, found it to be more hazardous (8.8) on the college level than on the high-school level (1.9). As would be expected, 81 per cent of the injuries occur to the leg and foot, the remaining 15 per cent occurring to the back (10) and the arm and shoulder (5).

Skill Controls

Modern Dance. Ruth H. Bloomer, Assistant Professor of Physical Education at Connecticut College, recommends the following four skill controls for the avoidance of injury in the modern dance: 1. Dance Techniques which call for faulty alignment of knee and foot (the feet turned out without the knee being turned out also) should be avoided. 2. Teachers should avoid using falls in which the knee, elbow, or base of the spine hit the floor while they are bearing the weight. 3. Another person or teacher should never use force to increase the stretch of a dancer. 4. There should be sufficient forward flexion to compensate for hyperextension of the lower back.

Because modern dance is done barefoot, it is extremely important that the floor be free from splinters and of proper texture for such work. Likewise, outdoor surfaces should be suitable. The various types of recommended floor finishes are described in Chapter VIII. It should be noted, however, that cement and other such nonpliable surfaces are not suitable for

this activity. The benefits of dancing barefoot on good turf are also worth mentioning. Exercises and stretches, preferably done on the floor, should be used for *thorough warm-up*. This is particularly true before public performances, where this important fundamental is likely to be neglected. The necessity of warming-up properly has been previously discussed (Chapter VI), but is mentioned in this connection because of its importance. The precaution about public performances is mentioned again (as in Chapter VI) because the reader may have missed this cardinal point. Jumping and leaping should not be given until the muscles of the legs and feet have been sufficiently strengthened. Special exercises and the usual graduated jumps and leaps can be used for this purpose.

Folk, Square, and Social Dancing. *Low heels* should be worn for folk dancing. The use of proper shoes for all dancing that requires shoes is, as in most activities, one of the most important safety precautions. High heels, whose use cannot be prohibited in many social gatherings, endanger even the most adept dancer. Dangerous pins and jewelry should not be worn. This precaution applies, of course, to all types of dancing, but is mentioned here because street clothes are often worn for folk and square dancing. The spirit should be kept gay, but the dancers should not be allowed to become too rough and boisterous. The experienced teacher has learned the best methods of striking the happy medium between having a good time and allowing the dancers to endanger each other.

Acrobatic. The safety precautions observed in tumbling should be applied in acrobatic dancing. (See page 261.) Acrobatic dancing should avoid the extreme hyperextension of lower back and stretching of the abdominal muscles so often associated with this style of dance.

Fencing

Fencing, of course, was an outgrowth of the use of swords as a weapon of war. It probably originated in Germany near the middle of the fourteenth century, but it remained for the famous Frenchman, Henri Saint-Didier, to give names to the

major movements which have been accepted and used wherever fencing is a sport. For many ages dueling with swords was a favorite method of revenging insults throughout the world, and it was only abandoned in the United States after the Civil War.

Fencing Potentially Dangerous. Although it is a potentially dangerous sport, protective equipment and careful instruction have made it mildly hazardous. According to Lloyd and Eastwood, college men have the best record, with a 1.3 incidence; high-school participants are next, with 2.0; and college women last, with a high of 2.8. The injuries are primarily wounds to the head, neck, shoulder, arm, and hand, with some sprains reported of the leg, foot, and thigh due to slippery surfaces. Craig, successful University of Illinois fencing coach, says: "The chief hazard in fencing occurs when a foil blade snaps suddenly under the stress of its use. This problem can be approached in two ways: first, by providing safer and better blades; and second, by providing improved jackets based on protective techniques used in other sports." [7]

Specific Controls

The foil top should be inspected for security and the blade tested *each time* before use. The proper technique should be followed in wrapping tips, and tips should be replaced whenever signs of wear or insecurity appear. Craig discovered that taping the tip down about six or eight inches increased the safety factor greatly. This not only strengthens the weak end of the foil, but tends to make the blade bend over when broken, thus rendering the broken end less dangerous.

There are at least two scientific methods of testing blades: they can be X-rayed, or they can be submitted to the magnaflux method. In the latter test, the blade is immersed in iron crystals which are then magnetized. Failure of the crystals to line up properly at any point indicates a flaw or break. It is doubtful that many schools can avail themselves of such testing

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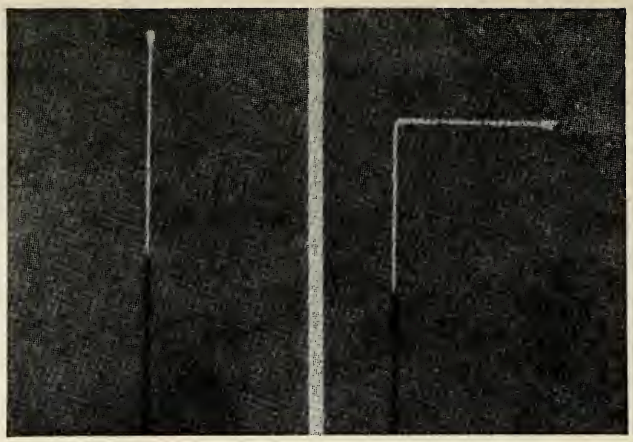
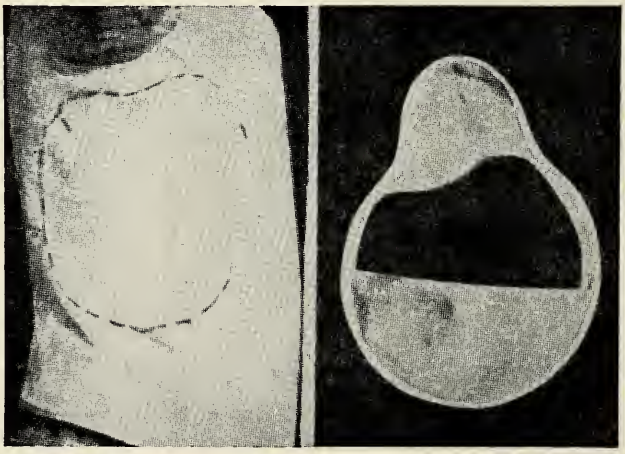
[7] "Safety in Fencing," *Journal of Health and Physical Education,* September, 1939, p. 403.



(*a*) *left.* A blade taped at the tip with strips of narrow tape. (*b*) *right.* A blade which snapped in action. The tape tends to cover the broken end.



(*c*) *left.* The dotted lines indicate the vulnerable area which is presented to one's opponent. (*d*) *right.* The protective fiber and pocket ready for installation.

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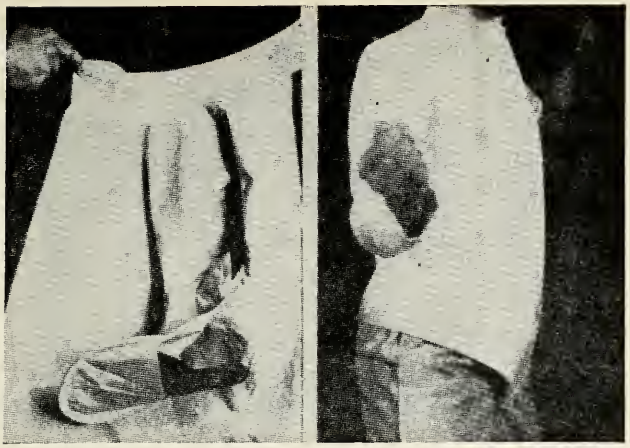
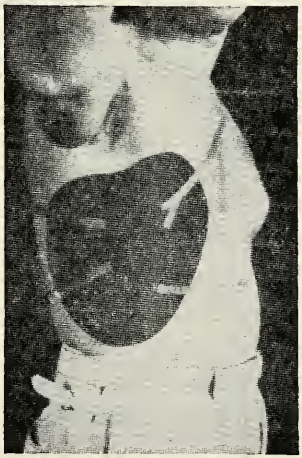
FIG. 40. TO MAKE FENCING SAFER

These safety devices developed by Coach Craig at the University of Illinois have been most helpful in reducing accidents in fencing.



(*e*) *left.* Interior of jacket showing how the pocket is moored. Note that the fiber pad is placed between the pocket and the jacket so that it does not touch the body. (*f*) *right.* The three-quarter type jacket, adjustable to all sizes, equipped with protector.



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(*g*) Fiber protector shaped to fit the body. All fibers must be bent and minor changes made in their shape to fit well under the armpit.

FIG. 40. (*Continued*)

devices, and most competitors will be forced to rely upon the less scientific manual method of determining the strength of their blades before each match. The user, however, should not assume that even a scientifically tested blade is unbreakable; there is no such blade. Craig points out that "If the fencer is told to watch for signs of old age in the blade (shown by softness in the first eight or ten inches and its refusal to spring back into shape), it can be retired before it breaks."

Strapping the Blade to the Wrist. The technique of strapping the blade to the wrist has become almost universal among foil and epée fencers. Its danger lies in the fact that if a blade snaps suddenly, it is impossible for the fencer to release it quickly enough to avoid injury to his opponent. Craig condemns this practice, saying, "Candidly speaking, I don't believe that one could ever sell the idea of eliminating this practice, but certainly among those learning the game it is a highly undesirable and dangerous practice." *The flèche attack should never be used on the interscholastic level.* Recognizing its great danger, even on the advanced level, the Western Intercollegiate Conference has outlawed its use. Because the flèche is used in international competition, it may not, however, be eliminated completely from intercollegiate competition.

Fencing jackets, sturdy masks, and gloves should be worn at all times in fencing. The danger of fencing without this protective gear cannot be overemphasized. A school should not conduct a sport such as this unless adequate protective equipment can be provided. Here, again, Craig has developed a special protective device which has proved successful. He has designed an almost heart-shaped fiber guard that is molded to fit over the side of the thorax and is moored into the jacket by means of a pocket similar to the football thigh guard. Masks should be provided with bibs, should be properly fitted, and should be kept free from dirt and rust. When it is necessary to have various fencers use the same masks, they should be disinfected between usage. *Rubber fencing strips should be used.* In mass fencing when it is not possible to provide the proper number of strips, care should be taken to conduct the class on

a nonslippery floor and to warn the fencers of the potential danger.

Handball

Even though there are many more handball players outside of school than in school, it is reported that there are at least 224,000 high-school and 13,755 college participants. Although it is one of our most strenuous games, it is a nonhazardous activity. The injuries are predominantly strains and sprains, with a number of contusions due to collisions of players with walls.

Specific Controls

Handball gloves should be worn at all times when playing. A few hardy players can play without gloves, but they are a "must" as far as safety is concerned. Rules make them a "must" in tournaments. Doctors, dentists, and musicians who especially fear finger injuries should wear padded gloves. Breakable glasses should never be worn during play, and it is questionable whether any type, even with guards, should be worn.

There should be at least four feet of space between single wall courts. This is an administrative precaution that should be observed particularly in makeshift quarters.

Additional Suggestions. William T. Mackie, Coach and Instructor of Physical Education, DuSable High School, Chicago, suggests that rules regarding "hinders" be read carefully and observed by all players. He states also that "while keeping the eye on the ball, one should learn to protect his eyes with a raised shoulder when ball is behind the player." The fundamental rule to watch the ball at *all* times would give the player an opportunity to turn his head and eyes away from a dangerous shot. Developing use of peripheral vision to watch ball and opponent makes for greater safety on the court.

Volleyball

Volleyball is probably the most misunderstood sport of the curriculum. Because very often it is not taught or played

properly, it is considered a "sissy" game by some people. It is a comparatively safe game, but the speed and force with which it is played by highly organized groups dispels any thought of its being a "ladies" game. Menke estimated that there were approximately 4 million persons playing the game in 1943, and Lloyd said there were approximately 924,000 high-school players in 1931.

Specific Controls

Posts and net connections should be secure. It is recommended that the nets be hung with cables and that the posts or wall brackets be strong enough to allow tightening with a winch. *Proper finger positions* for passing, setting up, and spiking are important in preventing injury to the hands. Finger injuries, which are extremely painful, are probably the most common among volleyball players, and constant attention must be given to the proper fundamental positions for all play. Beginners should be taught these positions through the use of practice formations.

As a safety measure, the number of players on a team should be limited to six for boys and eight for girls as provided for in the official rules. When too many players are on the court they are in each other's way and collisions are more frequent. (Too many players also spoil the game.) Margaret Powell, director of Health and Physical Education, Sam Houston College, Texas, reports: "Six-girl volleyball is used in Texas interscholastic League and has made it a better game." To avoid collision players should be coached to stay *in their own zones* and "call for" doubtful balls. Although players must frequently go into another's zone to play a ball, it is best to coach them to cover their own areas. In advanced play, of course, a regular system of covering another's zone is worked out as a defense against spiking.

Spiking by experts against inexperienced players, especially in exhibitions, *may cause severe face injuries and should not be encouraged.* Some may not agree with this precaution, feeling that such demonstrations stimulate interest in the game

and dispel the idea that volleyball is a "sissy" game. *A thorough jumping warm-up is advisable for all spikers.* This precaution is especially true for "older" players whose legs are most likely to be injured unless carefully warmed up. When they are blocking a spike, defense players should hold their hands in front of the face with the fingers spread and relatively tense. In fast volleyball the greatest danger is from hard-hit spikes, and defensive players must learn to block these drives safely. The blocker should always face squarely forward and time his jump with that of the spiker. *Hard overhand serving* should not be permitted in classes of inexperienced players. This is not only a dangerous practice, but hard serving is generally considered taboo among skilled players who rely upon placement.

Maurice Gogle, Dayton Y.M.C.A.

FIG. 41. A TERRIFIC SPIKE

When the ball is spiked with the terrific force that is shown here, it is potentially dangerous and can be handled only by expert players. Note the position of defense, with hands before the face, taken by the two defensive players.

Additional Precautions. The space about the court should be kept clear of hazards, and other types of balls should not be allowed in the gymnasium at the time of play. The ball should be returned to the server on the floor, especially among beginners. The ball should not be overinflated because it becomes heavy and hard on the fingers. When playing outdoors, players should not be allowed to use cleated or spiked shoes.

Swimming (Pool)

No other area of sports activities has been so thoroughly governed for safety as swimming. The American Red Cross, the Boy Scouts, the Y.M.C.A., and others have for many years conducted extensive water-safety education and training programs that have borne fruit. As successful as these programs have been in controlling the number of water accidents among the general population (National Safety Council's *Accident Facts* [1945, page 55] points out that the death rate by drowning in 1913 was 10.4, whereas in 1944 it had been reduced to 5.2), the school program has been even more spectacular in controlling the school pools. Lloyd and Eastwood found that the school accident incidence of swimming was only .6 per 1,000 exposures, which is probably as safe as sitting in the classroom.

Drowning Is Major Cause of Fatalities. A salient point which must be kept in mind, however, is that drowning ranks third among all causes of accidental death among boys and girls between the ages of fifteen and twenty-four, second among the five–fourteen age group, and fourth among the group up to four years. This record of drownings almost entirely outside of school premises indicates the need for an even more thorough job of water-safety instruction in our schools. It must also be remembered that usually only drownings are reported and that hundreds of *near* drownings are never recorded.

Thirty-four per cent of the accidents result in injuries to the head and face, almost all of which are minor wounds and bone bruises. The leg and foot are the next most frequently injured part of the body (30 per cent), most of the injuries being sprains.

Arm and hand sprains and back strains account for the next largest grouping of injuries, none of which are serious.[8]

Only school *pool* swimming and diving will be treated in this section. Outdoor swimming is covered in Chapter XIII.

Specific Administrative Controls

No one should be allowed to enter the pool unless he is supervised by an instructor or officially designated lifeguard. This rule is rigidly enforced in most schools, and its safety importance can scarcely be overestimated. Luehring says:

> The swimming pool is an alluring aquatic medium which presents continuous elements of danger. By means of the teaching and learning of swimming and diving skills, and the mastery of aquatic breathing, human beings have developed remarkable adaptability to the water, thus greatly reducing the danger element. Nevertheless the risk of water accidents, even among skilled swimmers, is such that the most careful instruction and constant vigilance are necessary on the part of the instructors and lifeguards whenever the pool is in use.[9]

An instructor should be the first one in the swimming pool room and the last one to leave. There should also be the established rule that no one is to enter the water until the instructor is present, which will allow the swimmers to undress and start showering in case the instructor is unavoidably late. All means of entrance to the pool should be locked when it is not in use. When the pool is in use, the doors should *never* be locked. If it is necessary to prevent "sightseers," signs or guards should be posted. Also, special care must be taken to prevent anyone from diving or falling into the pool when it has been emptied of water. Swimming classes should not be scheduled for the first hour following a meal. This provision is not necessarily recommended as a deterrent to stomach cramps, which will be discussed later, but because of the fact that during this

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[8] Lloyd, Deaver, and Eastwood, *Safety in Athletics,* p. 96.

[9] From *Swimming Pool Standards,* by Frederick W. Luehring. Copyright, 1939, by A. S. Barnes and Company, Inc. P. 62.

hour students are likely to be less alert, which may lead to accidents. Experience has taught most instructors that this hour is the least desirable teaching period. Simon McNeely, Louisiana State Supervisor, points out that exercise may not be harmful at this time if there is little emotional upset.

Flutterboards, floats, balls, and so on should *not* be used in the pool unless permitted by the instructor for special instruction or recreation. The indiscriminate use of these devices usually leads to unreasonable activities and carelessness that makes the pool a dangerous place. Some instructors find it more profitable to instruct without the use of artificial aids of any type.

The buddy system should be used in beginners' classes, in all large classes, and in classes below the high-school level. In small pools with clear water and adequate guards, the buddy system may not be necessary, but it is an accepted safety precaution. The system is also a good teaching device. The safe size for class instruction will of necessity be governed by the size of the pool, clearness of the water, ability of the instructor, and level of instruction. Luehring recommends that the class be limited to twenty-five, especially for beginners, saying: "If larger classes are required, a correspondingly larger part of the teacher's time is taken up by lifeguard duties, thus limiting teaching efficiency." Columbia University limits the size of classes to twenty-five, and the Rochester Public Schools set a maximum limit of thirty-five pupils per instructor. The pool load for sanitation should be determined by the Gage formula.

The instructor should be dressed so that he may enter the water in an emergency. It has been accepted professionally that the instructor should be dressed appropriately for all activities, and in swimming it is a *must* from the safety standpoint. Occasionally a drowning person is unable to catch hold of or be rescued by the lifesaving devices offered, and when it becomes necessary for the instructor to go in after the one in trouble, he should be appropriately dressed. *Sufficient lifesaving equipment must be provided for the pool.* The following items are minimum recommendations:

2 fifteen foot bamboo shepherd's crook poles
2 flutterboards approximately 1 foot by 3 feet by 2 inches capable of supporting not less than 20 pounds
2 throwing ring buoys, 18 inches in diameter, with 60 feet of 1/4 inch manila line attached
1 first-aid kit containing aromatic ammonia, tincture of iodine, sterile gauze, absorbent cotton, surgeon's plaster, and bandages of various sizes
2 woolen blankets
1 stretcher

All swimming instructors should be qualified Red Cross Water Safety Instructors. Qualification by the Y.M.C.A., Y.W.C.A., the Girl Scouts, the Boy Scouts, or other equally reliable organizations should also be acceptable. However, the American Red Cross service has been so widespread that most schools follow its leadership.

The nonswimmers' area should be roped off. Large pools with large classes need this provision especially, but it is of sufficient importance to use under all conditions. Much of the trouble comes from beginners' becoming panicky when paddling unknowingly into water too deep for standing. In large classes of mixed abilities it is advisable to require nonswimmers to be identified in some manner, such as the wearing of red swim caps. Classes for instruction should not be this large, nor should there be groups of varying abilities, but if these conditions do exist, such added precautions are necessary. Although boys object strenuously to wearing caps, Craig says:

> The use of swimming caps which has become almost universal for women should become equally universal for men. Almost unbelievable amounts of hair are taken off the bottoms and from the hair strainers of pools where men swim without caps. Films of oil on the surface of the water are no rarity, and the general clarity of the water cannot help but be affected. Furthermore, in an age where many men and boys wear no covering on the head out of doors, the soaking of the hair and scalp may have bad effects on

health. The swimming cap should be required of *all* swimmers. There is no health argument against it, plenty for it.[10]

The Joint Committee on Bathing Places of the Conference of State Sanitary Engineers and the American Public Health Association specifies, "At artificial pools all bathers of both sexes should be required to wear rubber bathing caps." If the pool is so organized that the different groups can be kept segregated, identification marks may not be necessary.

Specific Leadership and Skill Controls

Instruction in the safe use of the pool should be given at the first class meeting, and the users repeatedly instructed in proper conduct thereafter. Often the first meeting is devoted to instruction in sanitation and the safety rules are neglected. It is recommended that the safety rules be incorporated as a part of this instruction, and that users' printed instructions be distributed to the students. It is also recommended that the rules be posted on the bulletin board or printed on large signs so that there will be no reason for a student's ignorance of them. Beginners should be informed concerning superstitions associated with drowning that have no basis in actual fact. (These beliefs reduce the swimmer's efficiency and produce a fear complex.) Some of these common superstitions are that a drowning man goes down twice before the third and final time; that the lungs fill up with water when drowned; that cramps will usually drown one. To instill confidence, debunking of such misconceptions should be a part of the instruction regarding the water's ability to support a person.

Bathers should be informed of hazards of, and instructed in the safe use of, beaches, rivers, lakes, and the ocean. This instruction can be integrated throughout the course, but the most logical time is in the lessons given before summer vacation. The information to be included is too extensive to be enumerated here, however, most of the material is covered in Chapter

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[10] H. W. Craig, "Safety and Hygiene in the School Swimming Pool," *Journal of Health and Physical Education,* April, 1941, p. 278.

XIII. *Safety* magazine has printed water-safety lesson outlines for use in junior high school and elementary school which might prove valuable in presenting such lessons. Bathers should be instructed in the accepted best practices and trained in the proper techniques of lifesaving. All pool users should learn the accepted principles of rescue, and the various levels should be taught the procedure capable of being executed by each particular group. Just a few techniques are really necessary. It is not necessary, of course, to require all to take a complete lifesaving course, but it is highly desirable to make such courses as the Junior and Senior Life Saving Courses of the Red Cross available. Capable and reliable student lifeguards should be qualified as Red Cross Lifesavers and used in the pool as desired. Luehring and others recommend at least one lifeguard per seventy-five persons or fraction thereof using the pool at a given time for general recreation. With more than the recommended twenty-five pupils per instructor, additional lifeguards should be provided for class work as necessary. Many instructors require one lifeguard to remain always on the opposite side or end of the pool from the instructor.

Nonswimmers should not be allowed to go beyond their depth, especially with artificial support. Occasionally a nonswimmer will be so bold as to jump off into deep water without assistance, but usually the trouble comes from those who have mastered a few strokes and want to try out their newly found skill. The use of artificial support is particularly risky during recreation periods. When a prankish swimmer dumps a nonswimmer off an inner tube, he may find himself in unsuspected trouble, and the nonswimmer may be so frightened that he will never again be at home in the water. Inner tubes should not be used, but when they are used the valves should be taped down so that they cannot poke one's eyes.

Persons who have repeated ear infections, damaged ear drums, or have had mastoid operations should use *special precautions to prevent water from reaching the middle ear.* The percentage of persons who are adversely affected by water is small. Some, however, if so designated by a physician, should

not enter the water, and others may have to restrict their activity to surface swimming and avoid diving. Some may have to wear ear or nose plugs for safety's sake. Only those types of plugs that are approved by the physician should be used.

Running about the pool should be prohibited because of the danger of falling on the slippery surface. It seems almost impossible to develop a material suitable for surfacing the runways about the pool that will also be nonslippery, and therefore most such decks are very slippery. It becomes necessary, then, to curb running and unnecessary playing about the pool. Ducking, pushing, and climbing over others in the water should not be permitted. It seems rather heartless and not very understanding sometimes to curb youngsters who are having a good time in the pool, but the resourceful instructor will provide activities that fulfill the needs of the swimmers and will otherwise conduct the pool so that the problem will seldom arise.

The diving board should be used *only with special permission of the instructor.* By this is not meant special permission for each individual, but for the group. Howard, physical education instructor at New York University, feels that there is little danger if necessary precautions are followed, such as preventing cross-pool diving within range of the board; that not more than one person should be allowed on the diving board at one time, and that he should not be allowed to bounce out of control; and that divers should not be allowed to attempt dangerous dives beyond their abilities. Divers should leave the water as soon as possible after the completion of their dives. A line of floats should be available to string across the diving area when it is necessary to segregate the divers. Intermediates or mixed-ability classes should not be required to jump into deep water until the instructor ascertains their respective abilities. (Nonswimmers often do as told!) Often a student gets signed up in the wrong class or overestimates his ability, and when he is required to jump or dive into water over his head, he will do so only to become panicstricken and have to be rescued. It is suggested that qualifying tests be required for all classwork.

How Dangerous Are Cramps? Recent research tends to dispel the theory that stomach cramps are caused by swimming too soon after eating. A study by Mason, Franseen, Rork, and Horne throws considerable light on the whole subject of cramps. They conclude:

> 1. Drownings occurring as the result of cramps are very improbable. 2. Cramps do not occur often enough to be alarming; only 6 per cent of the subjects in this experiment reported them, and 92 per cent of the cramps reported were either in the foot or leg. 3. One is apt to call any pain noticed while swimming, whether it be in the side or stomach, viscera or abdominal wall, an abdominal cramp. The only two cases of abdominal cramps and the only two cases of side cramps reported in this study were definitely survivors. In fact, they suffered no apparent pain; they were not assisted in any way from the pool; they were perfectly capable of stopping at the end of the hour and filling out the questionnaire. 4. There seems to be no physiological process on which to base the assumption that eating before a swim is conducive to the occurrence of cramps. 5. The factor which seems most predisposing to cramps occurring in a pool situation is fatigue of untrained muscles either before or during the swimming period.[11]

The American Red Cross and other authoritative sources have not as yet seen fit to discard their customary precautions, so bathers should be instructed not to enter the water for at least one hour after eating, and for at least an hour and a half after a heavy meal.

Water polo and other games require specific precautions with which every instructor should be familiar and should teach with the game. Water polo has been considered one of our most dangerous games. Although no statistics are available to substantiate this belief, almost any player will vouch for the game's ruggedness. Space will not permit the discussion of its hazards or the hazards of the hundreds of other games conducted. It should suffice to say that the instructor should be aware of the attendant hazards when introducing and teaching

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[11] From *Official Aquatics Guide* 1943–44, copyright, 1943, by the National Section on Women's Athletics of the American Association for Health, Physical Education and Recreation. P. 52.

the game. Eastwood of Purdue feels that water polo should be played only by varsity teams under trained coaches.

Correct Lifesaving Methods

In cases of emergency the instructor should use the lifesaving apparatus; if it is not successful, he should enter the water to assist. This follows the regular Red Cross lifesaving procedure. The instructor should not enter the water to assist the pupil in preference to using the lifesaving apparatus, unless such apparatus is unavailable. Also the instructor *should never allow students other than qualified lifeguards* to enter the water to assist. Tattersall of the Red Cross, however, says swimming assistance can be directed a few feet away or a human chain may do the trick. In cases of suspected drowning, *artificial respiration* must be begun at once and continued until the victim is revived or a physician orders it stopped. The Shaffer method of artificial respiration is generally accepted as the best, and *every person* should know how to apply it properly. It may be advisable for advanced students to discuss and practice the Sylvester, Nielson, and other proved methods of resuscitation. Space cannot be given here to record the other precautions and methods of application to be observed. The reader is referred to *Life Saving and Water Safety,* the American Red Cross Manual.

Additional Suggestions. The depth markers should be kept legible. Only regulation diving boards should be used. They should not be installed in pools that do not have sufficient depth, width, and ceiling height. (See Chapter VIII.)

Wrestling

Wrestling is as old as man. All peoples, ancient and modern, have practiced it in one form or another. Wrestling matches have taken many odd forms among the various nations. They vary from the gigantic Sumo type in Japan, where the winner is the one who throws the other to the floor or out of the circle, to the catch-as-catch-can type of pinning the shoulders

to the mat, as practiced in this country. To our knowledge the most brutal form of wrestling was that of the ancient Greeks, who, during the decline of Grecian civilization, developed the pancratium, which was quite similar to the sham professional bouts of today except that the Greeks "meant it." Almost every college conducts wrestling as a competitive sport, and many high schools do likewise. It is especially popular among the secondary schools of Oklahoma and Iowa, where it has reached a high degree of perfection.

Fine Developmental Sport. Wrestling, one of physical education's finest developmental sports, is also one of its most hazardous. It ranks fifth as a cause of accidents among high-school participants and third among colleges, and high-school wrestling injuries tend to be even more serious than football.

Hand and arm injuries are most prevalent on the high-school level, and, according to Lloyd and Eastwood, are four times as serious as those on the college level. On the college level, almost all parts of the body come in for an equal share of disability, with shoulder injuries slightly in the lead.

A Safe Sport. Following Lloyd and Eastwood's studies Doscher, wrestling coach at Brooklyn College, made a similar study[12] of a local situation for the year 1940–41, covering a period of nineteen weeks and including six intercollegiate matches. His findings do not agree with the formers' national studies. The injuries received by twenty participants were largely abrasions and slight lacerations, plus some bloody noses. Only seven necessitated the wrestlers' losing one or more days' activity, and a doctor was needed on only four occasions. The number of days lost was 13.4 per 1,000 exposures, as compared with the average of 24.7 per 1,000 exposures reported by Lloyd and Eastwood. It is interesting to note that Doscher's squad experienced the majority of injuries before the competitive season, and only ten during the actual season. He concluded that about two thirds of the total injuries were due to the na-

[12] "Safety in Physical Fitness Programs—Wrestling." *Journal of Health, Physical Education and Recreation,* September, 1942.

ture of the game. Reeck[13] reported that the main causes of wrestling accidents were improper equipment, lack of progressive training, and carelessness.

Specific Administrative Controls

Wrestling should be conducted on mats and at a safe distance from walls or other obstructions. Because wrestling is conducted during the basketball season and can be accommodated in a relatively small area, it is often shunted off into some totally unsuited room. Under these conditions the wrestling coach is advised to keep a careful check of all accidents, and if the number is unusual, demand more suitable facilities. During gym classes, when wrestling is taught to a large number, special care must be taken to keep the participants away from walls and other obstructions. Matches should be conducted only on regulation mats, and *surrounding protective mats* should be provided. Practice matches should be conducted on mats that have clean cotton or rubber covers. It is necessary in both practice and actual matches to provide extension mats outside the wrestling surface for about ten feet for the protection of wrestlers when "leaving the mat." The use of the ring makes wrestling more dangerous because of the hazard of the ropes and standards.

Proper wrestling gear should be provided for both practice and interschool competition. For practice, headguards, special gauze and cotton, or rubber bandages should be provided to protect the ears from injury. For class instruction the headguards are probably not necessary. For early season workouts Doscher recommends full-length leg tights, shirts, and sweat pants and shirts. Special knee and elbow pads should be furnished when necessary. Shoes should be of the light sneaker variety, never with hooked eyelets. *Weight reducing, except under a doctor's supervision, should not be allowed.* There is little evidence

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[13] *A National Study of High School Wrestling Accidents.* Master's Thesis, Purdue University, 1938, as quoted by Floyd R. Eastwood in Pre-Convention Conference on Safety Education. *Abstract of Proceedings.* Center for Safety Education, New York University, 1940, p. 12.

of relationship between weight reduction and accidents, but from the standpoint of health most medical authorities are opposed to promiscuous weight reduction. When polled on this question some coaches felt, as did Law, Wrestling Coach at the University of Illinois, that minor weight reduction was all right, but that wrestlers should not reduce "through a weight" to get to a class below. According to Franklin of Indiana University, "loss of weight by water reduction on college level probably has no ill effects for short periods."

Specific Leadership and Skill Controls

In practice bouts care must be taken to match wrestlers of equal weight and size, especially novices. It is particularly necessary to match participants in this manner for physical education class work. Experienced wrestlers of ability are often matched out of their weight class to develop speed and strength, but such matching in intramurals or classes is dangerous. Illegal holds and dangerous positions should be thoroughly understood and avoided by participants. The more successful a coach is in teaching his men to avoid this phase of the sport, the more successful he is likely to be in winning and in preventing injuries. Such instruction should come early, often, and intensively.

Rings should not be worn and fingernails must be kept short. There is constant bickering among members of the average squad regarding the length of fingernails. Although most scratches from nails do not hurt very much, the resultant infections are often serious. The coach should not allow malicious punishment by or to his men. He should call the referee's attention to such fouls as strangleholds, head butting, binding or rubbing of knuckles across the face, striking with the edge of the hand, elbow in the ribs, or gouging. According to the rules, a coach may not interfere with the work of the referee, but in cases of oversight or ignorance on the part of the official, he is justified in calling attention to such offenses. Some boys are naturally sadistic and must be curbed often. Many wrestlers acquire their concepts of the sport from pro-

fessional wrestling, but most competitors will conform to the pattern in which they have been trained by their coach. *All wrestlers should be made aware of the vulnerable parts of the body,* such as the bridge of the nose, the back of the neck, the larynx, the solar plexis, the floating ribs, the kidneys, and the groin. Not only should they be made aware of these vulnerable parts, but they should be instructed also in the proper techniques of protecting themselves from illegal punishment and taught never to inflict such punishment themselves.

In mass instruction wrestlers should start from the referee's position. This safety measure applies not only to the usual physical education class instruction, but to the overcrowded varsity squad practice as well. The danger of wrestlers having others fall across their legs when the latter are in unusual positions cannot be overemphasized. Reeck found that the greatest number of accidents occurred while the individual was working on his feet. The activities used in mass instruction should be adjusted to the situation. When the instructor introduces advanced holds and do-or-die applications of holds in large groups, accidents are bound to occur. He must not concentrate on the instruction of one or two wrestlers while the others "run riot." Handling large groups calls for good organization and a comprehensive group-instruction type of control.

Additional Suggestions by Coaches. Doscher recommends at least two weeks of conditioning before allowing men to wrestle. This would include calisthenics, running, bar work, tumbling, rope skipping, medicine ball throwing, proper falling, proper lifting and carrying of squad members, and practice of holds. Additional safeguards practiced under Doscher's direction were: 1. No wrestler can enter the wrestling room unless an instructor is present. 2. No wrestler may start any active work until all safety mats, rubber covers, and other materials are properly placed. Each wrestler is a committee of one to see that this equipment remains in proper place during the entire training period. 3. Each wrestler is trained to report any injury to the coach. 4. The wrestlers are trained to stop work whenever a real sign of physical distress appears, or the moment

they find themselves off the mat. 5. Bathing is required after each exposure. Infection was eliminated largely through this procedure.

Reeck reported the following suggestions made by a majority of the coaches surveyed: the use of larger mats, rubber-soled shoes, and canton flannel mat covers; the elimination of pickups and slams, abusive hammer lock usage, and dangerous weight reduction; proper conditioning; better preparation of coaches in training methods; more emphasis on students' reporting minor cuts, abrasions, and strains; more careful check of condition; and full-time team physicians.

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XI

OUTDOOR WINTER SPORTS

America appears to be rediscovering the pleasure of playing out of doors during winter. Each year more and more people are turning to the outdoors for their recreation on ice or snow. Skiing, the most hazardous of the winter sports, has had the most phenomenal growth. Probably a million converts to the sport have been made since 1940. Skating and coasting have also become more popular. The holding of the 1932 Olympic Winter Games at Lake Placid, New York, was one of the great stimuli to this growth and development.

Among the outdoor winter sports, skiing is by far the most hazardous. Its tremendous growth in popularity, especially among schools and colleges, makes it imperative that special emphasis be placed upon its safe conduct. Hockey, another winter sport which is potentially hazardous but not sponsored by many schools, must also be controlled (as it apparently is) or it will take an unnecessary toll of injuries. Skating and coasting safety is primarily the responsibility of governmental agencies and school administrators because it is up to them to provide safe places for both sports.

Skiing is promoted largely as a commercial enterprise, skating by municipalities, and coasting by both. Even under such guidance and supervision these sports may be hazardous but when participated in at places not organized for safety they are very dangerous. *It is recommended that everyone participating in winter sports endeavor to do so at an organized and supervised location.* This precaution need not be observed for harmless backyard or corner lot coasting or skating. Skating on deep-water ice which has not been tested and coasting on

streets which have not been closed to traffic are practices which have claimed many young lives and limbs.

Schools Are Beginning to Teach These Sports. Many schools are now offering instruction in winter sports and many physical educators, recognizing the pleasures of "snow play," are taking their classes to the playground during the winter months. This is especially true of Northern schools where the sports are very popular. In warm climates a few artificial indoor skating rinks have made skating and instruction possible. *It is recommended that schools provide instruction in outdoor winter sports where possible.* As has been pointed out before, mastery of the fundamental skills and a knowledge of the hazards involved give the learner a sound basis for safe participation.

Coasting

Relatively few persons will ever experience the thrill of bobsledding on one of the few "professional" courses, such as the Olympic run on Mt. Van Howenberg at Lake Placid, New York. This sport, which hurls men over ice-coated chutes at 70 miles per hour on steel bobsleds which are eleven feet seven inches long and cost over 500 dollars, is so hazardous that the few who get to ride as passengers are required to sign the following waiver:

In consideration of your accepting this entry, I hereby for myself, my heirs, executors, and administrators, waive and release any and all rights and claims for damages I may have against the Adirondack Association A.A.U., The Amateur Athletic Union of the United States, Adirondack Bob Sled Club, Town of North Elba in Trust for Park District of Town of North Elba, Conservation Department State of New York, or their agents, representatives, successors and assigns, for any and all injuries suffered by me in the above race.

It will be recalled that the American teams captured the two 1932 Olympic championships, the double and four-man team events. The brothers Hubert and Curtis Stevens won the

two-man event and W. L. Fiske, Eddie Egan, Clifford B. Gray, with Jay O'Brien at the brakes, won the four-man bob title. The record time for a single run (heat) in traversing the one and one half mile course at Placid for the two-man sled is 1 min. 53 sec., and for the four-man event, 1 min. 40.4.

Center for Safety Education, New York University

FIG. 42. "CHANNELIZED" COASTING SAFEST

Regular toboggan runs not only provide great fun but safety. The coasters must "channelize" just as is recommended in traffic.

Coasting or tobogganing on country slopes or supervised areas is a far cry from competitive bobsledding and is a relatively safe activity. The only dangers are those of striking

trees or other stationary objects, and being struck when returning to the hill top on foot. The toboggan runs, because of their chutes, eliminate some of these dangers. *Coasters should not cross the coasting path on foot.* When it is evident that a coaster is going to collide with some object, it is usually best for him to roll off the sled. Another common danger is that of riding down steep hills backward, "piled on," or in other unusual positions. Sleds should not be overloaded, and small ones should not precede large ones down the hill.

Street Coasting Dangerous. The most dangerous place to coast is on a street that has not been roped off for safe usage. Even those streets on which there is relatively little traffic should not be trusted for coasting. An especially hazardous practice is that of hooking one's sled to an automobile. Even in olden days when children hooked such rides behind horse-drawn cutters and bobsleds it was considered a dangerous sport. Although very few hitch rides in this manner today, sometimes an automobile owner volunteers to pull a sled or toboggan. Since this is such a dangerous practice, which is prohibited by law in some states, it is strongly advised against.

Ice Hockey

Wherever there is ice skating, there is usually hockey. It ranges from the "shinny" type played by the kids, to the expert professional brand played before huge and excited crowds. Pick-up games played by youngsters without benefit of proper equipment or officiating can be quite dangerous. Tin cans or other injurious pucks should not be used, and an attempt should be made to play according to the safety precautions of the official rules. The precautions of skating, listed in that section, should be observed.

School Hockey. Ice hockey is not played extensively as a school sport, nor is it an extremely hazardous sport as it is played among schools. Some people are prone to judge the hazardousness of a sport by the professional brand of play, and so they think of ice hockey as being extremely dangerous. Lloyd and Eastwood found the game to rank seventh among high-school

sports and tenth among colleges in the degree of hazard. Obviously, however, it *can* be a very hazardous sport, and it is assumed that those schools studied by Lloyd and Eastwood selected their players from among the best skaters, provided good equipment, and played under proper rules.

Acme Photos

FIG. 43. WEAR HEADGEAR

Ice hockey is one of sports' fastest games and is potentially hazardous at all times. In this game the player must be a fine skater, a skillful stickhandler, and in excellent physical condition. The West Point player is wearing headgear which is recommended for all players.

Specific Administrative Controls

It is particularly dangerous in this sport for the player not to be provided with, and wear, all *necessary protective equipment and warm clothing.* In addition to the regularly accepted pads and protective equipment, every player should wear a headguard. This recommendation is made in the *Official National Collegiate Athletic Association Ice Hockey Rules* and several of the coaches polled by the writer pointed out this need. Coach Rogers of Phillips-Exeter recommends the use of a special mask for goalies during practice.

Practice or games on outdoor rinks should not be held

when the ice is soft or thin. Harry Briggs, coach at Tufts, comments on this item:

> I agree that on pond ice it would be unwise to hold practice or play games on thin or soft ice. On outdoor ice surfaces, however, that have no water beneath them, I do not believe that there is an element of danger, unless it is that participants can easily trip and injure themselves as a result of thin or soft ice. I do not believe this to be a major problem, although it is a problem to the coach who likes to conduct beneficial practice sessions.

Specific Leadership and Skill Controls

When he is thrown to the ice, the player must protect his face from the skates of others by dodging or placing his arm over it. Other players are usually very careful to avoid cutting a player who is down, but the fallen player must take certain precautions, nonetheless. The best method to use to avoid being checked and possibly injured is for the player to skate with head and eyes up while he is carrying the puck. This is one of those sport fundamentals that is also a safety factor. Most coaches spend many hours teaching this important knack.

Avoiding Injury in Checking. It is poor hockey to avoid or lessen a check by keeping the hands or arms out in front. Such practice might be subject to penalty, and might cause injury to the arms. A comment on this point by Coach Riley of Nichols School was: "The body can withstand a blow better than an extended arm, especially when the player carries a hockey stick, which might injure the other player. If the stick breaks, either player might be seriously hurt." Coach Rogers adds: "I coach the shoulder body-check, never hip, which results in a leg check. . . . I have tried for years to get the Rules Committee to abandon the intentional body-check."

Players who attempt to injure opponents should be removed from the game. If checking results, the rules *require* that such a player be removed. Rules governing the use of the stick should be strictly enforced and the players impressed with the seriousness of disobeying them.

Additional Precautions by Coaches. 1. Only one puck

per group should be used when working on one goalie. 2. Improve skating. Short strokes, better balance, and fewer injuries will result.

Skating

Although the origin of ice skating is lost in antiquity, the modern era dates from E. W. Bushell's perfection of the steel blade in Philadelphia in 1850. Figure skating was introduced as a sport in Vienna by an American ballet master, Jackson Haines, about 1864. Sonja Henie, after winning the Norwegian figure skating championship in 1923 at the age of ten, captured twenty-seven championships, before she came to America and became this nation's idol. Speed skating, the more popular form of competition, probably originated in Canada as early as 1887, and the first North American championships among men began in 1891. Among the champion speed skaters in our country have been Norval Baptie, R. G. McLean, Alex Hurd, Gladys Robinson, Florence Hurd, and the spectacular Kit Klein.

Skating Itself Not Dangerous. Ice skating is not considered a dangerous sport. The greatest danger arises from skating in unregulated or unapproved areas on rivers and lakes. Youth's craving for adventure all too often leads them to skate on such dangerous surfaces. Just how thick the ice must be for safe skating depends upon its age and quality, and since the thickness and quality of ice varies greatly in the "open" waters of rivers and lakes they are usually unsafe. It is therefore recommended that *one skate only upon those surfaces designated and approved by municipal or park authorities.* Every community can afford to flood vacant lots or other areas to provide its youth with safe skating surfaces.

Specific Administrative Controls

Skating areas over water deep enough in which to drown should have such *rescuing devices* as life buoys, ladders, boards, boats, and ropes available. The lack of rescue devices has been responsible for the loss of innumerable lives. *Crowded skating*

areas should be organized to separate the beginners from advanced skaters, the figure skaters from the speed skaters, and the hockey players from all others. The usual procedure on indoor rinks is to use the outside track for skating in one direction (at a time) only and the interior space for figure skating. Special spaces or times should be allocated for hockey and for beginners to learn and novices to practice.

Leadership and Skill Controls

Beginners must be careful about falling because apparently no fall is more severe than a backward fall on ice. It is best to learn under proper guidance, especially if one is older, because such falls are then more dangerous. *The learner must remember to keep the knees bent and the body weight forward.* W. C. Bidlack lists a few "don'ts" for skaters in falling:

1. Don't put your hands behind you in a backward fall. 2. Don't land on a wrist, or hand, elbow, knee, or shoulder alone, if this can be avoided. *Try to land with as much body area as possible.* 3. Don't try to stop a fall. Relax and go with it. 4. Don't forget to tuck elbows, knees, and chin in. 5. Don't try practicing falls from a standing position until you have thoroughly learned how to fall from a crouching position. 6. Don't drag your partner down when you fall. Break away and relax just as you'd expect your partner to let you go if he or she were about to fall. 7. Finally, don't fail to watch where you're going. Any number of falls are caused by this simple failure. Regardless of what you do to yourself, you may hurt someone else badly by not watching where your blades are taking you.[1]

Next to falling, the chief cause of skating injuries is collision, either with other skaters or objects surrounding the rink. Special care must be taken by skaters not to go too fast and to skate under control at all times. Rink managers usually regulate this aspect of danger and provide very safe places to skate. Modern skates have extremely sharp blades and care must be taken not to cut oneself or someone else. The blade should be encased in guards when skates are not in use.

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[1] "Fall and Like It," Reprinted from *Skating*, May, 1945, with permission of the U. S. Figure Skating Association, holders of the copyright.

Ice Rescue. Usually a skater does not break straight through the ice but goes sprawling as the ice begins to give way. The first impulse to get up and skate away must be curbed, and the unfortunate person should attempt to roll or squirm to safety, because his weight will then be more distributed. If he does fall through, he should endeavor to keep the body flat and not let the feet jackknife under the ice. If the skates can be removed, it will be helpful. When the edge of the ice is quite strong, he may be able to extend his arms out over it and crawl back to safety. Usually, however, it is not possible for a person to save himself, so he should conserve his energy to stay afloat and await rescue.

Other skaters must resist the urge to skate directly to the rescue of the skating victim. Instead they must seek the assistance of a ladder, rope, board, or human chain.

Skiing

Probably no sport has experienced such an unbelievable growth in popularity as skiing. In 1930 the National Ski Association reported a total of 3,500 members and according to Menke in 1940, there were two million skiers in the United States, who were spending approximately 200 million dollars a year on the sport. It is estimated that at the present time there are at least three million participants in this alluring but potentially hazardous pastime.

Competitive Skiing. As a competitive sport, skiing is divided into four main categories: *jumping,* which only a few master, but which is the most spectacular; *downhill,* the most dangerous; *slalom,* the most graceful; and *cross country,* the most grueling, which requires unlimited endurance as well as skill. The world's record for jumping is 350.96 feet, made in 1939 by Joseph Bradl of Austria, at Plancia, Jugoslavia. The present American record of 289 feet is held by the famous Torger Tokle who lost his life in World War II. The greatest speed attained is 84.7 miles per hour, recorded in the Flying Kilometer at St. Moritz.

Skiing Can Be Hazardous. Unfortunately, no complete

national figures are available with regard to the accident incidence of skiing. Local studies and observation, however, would lead one to believe that skiing is responsible for an unusually large number of accidents and injuries. When the skiers are not properly trained, skiing can be one of our most hazardous sports. It is a sport which requires an unusually high degree of developed skill, good physical condition, and courage and good judgment.

Controlled skiing is not hazardous; experienced skiers are seldom involved in accidents. Skiing, however, is not an old man's sport. Persons over thirty years of age who have not been athletic should undertake skiing only after carefully weighing the requirements and consequences. As in other sports, those who have been good skiers but have "laid off" for a number of years should realize that they cannot expect to go out some week-end without any conditioning and do a gelandisprung and other feats accomplished when they were younger and in condition.

Competitive skiing may be quite dangerous. Raymond Smart of Massachusetts State College, Amherst, found in two championship downhill races that each skier averaged 1.49 falls and that 20.9 per cent of the falls in one race resulted in injury, whereas in the other no injury was recorded.[2]

Cause of Accidents. Accidents are usually caused by: skier not being physically fit; his not having mastered the fundamental skills; going too fast for ability or conditions; fatigue; faulty trails; weather and snow conditions; carelessness, recklessness, or other improper attitudes.

Specific Administrative Controls

The first safety precaution is the wearing of proper equipment, particularly boots and bindings. Warm windproof clothing is of the utmost importance. Ski poles should be of the best quality and of proper length. Boots should be roomy enough to allow the wearing of two pairs of woolen socks, but snug enough to avoid undue movement within the boot.

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[2] "A Study of Falls in Skiing," *Research Quarterly*, December, 1938, reprint.

National Safety Council

FIG. 44. THE SKI PATROL IN ACTION

One of the greatest factors for safety has been the National Ski Patrol. These volunteers, Ski Patrolmen of Yakima, Washington, take injured skiers away to first-aid and medical treatment safely and efficiently.

Safety Bindings. The most vital equipment for safety in skiing is proper bindings or harnesses. *It is recommended that beginners use the safety releasable type.* In fact, all skiers should consider the use of such a binding. This harness allows one's foot to be released when undue pressure is placed upon it in falling. Since most injuries are the result of falling and twisting the leg or foot when the skis go out of control, the use of releasable bindings may save many broken limbs.

A Simple Way to Make Skis Safer. The Ski Patrol Committee, of the Snow Chase Club of Chicago, advocates the following method for altering conventional ski bindings so that they will release in case of a fall:

To alter your bindings for safety release, *remove all toe-straps and sole lugs* from the toe irons, so that the boot is held in the toe

irons by friction. If necessary to adjust the friction grip, disassemble the binding, place each iron in a vise, and bend it with a hammer so that it has an inward angle of five or ten degrees. Adjust each iron so that when the binding is reassembled and the boot is tight in the binding, it will be very difficut to pull the boot toe *straight* up out of the irons; but a pull of 25 to 50 pounds applied under either *side* of the sole will twist the boot loose from the ski.

NOTE: "Micromatic" bindings should not be disassembled. Instead, place the side part of the iron in a vise upside down, and adjust the angle of the bend by striking on a spot which will avoid injury to the mechanism. Metal plates on the sides of the boot soles may have to be removed to provide sufficient friction in the irons. For everyone's benefit, ski repair shops have been given permission by the patent applicant to make this design alteration to existing bindings.

Skis should be of the proper length, strength, and flexibility. The usual length recommended is ten inches longer than the person's height or to the base of the hand when arm is extended over the head. The use of proper sunglasses is advised. Many instructors advocate that beginners do *not* use poles until they have progressed past the falling stage.

As in all sports, a thorough physical and medical examination is a prerequisite for every skier. Since skiing is so popular among young adults who no longer come under the school health examination program, this precaution is mentioned. The beginner or novice skier should select a practice area that has proper slopes and a ski patrol and where expert instruction is available. The National Safety Council adds other precautions: "Skiing excursions should not be undertaken with fewer than four in the party. Small parties starting off on lonely trails should have full information on the terrain they propose to cover; they should check out at some designated center, telling who is in the party, route proposed to follow, and expected time of return; they should report back on arrival." [3] *A person should never ski alone in remote and rugged areas.* Heavy fines have been proposed for members of ski clubs who break this rule.

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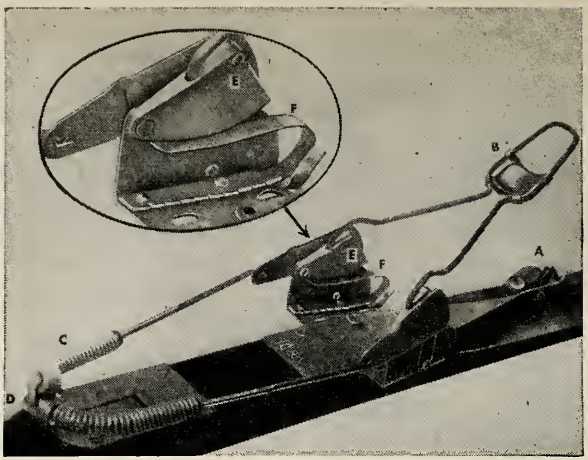
[3] *Safety in Physical Education and Recreation*, p. 81.



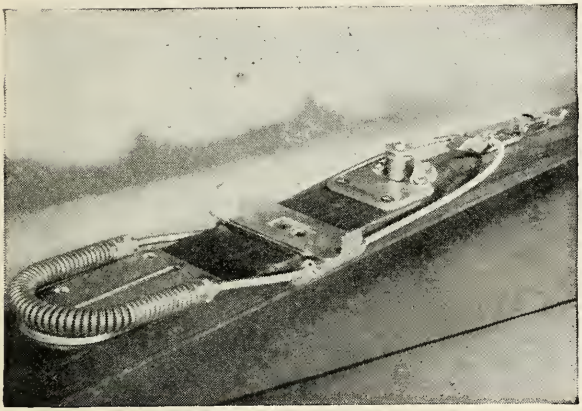
(*a*)

(*b*)

(*c*)

FIG. 45. (*a, b, c*). The Tavi Automatic Ski binding. A punch of the ski pole opens and closes the binding. The cams (E) pivot outward when the binding is opened, thus releasing the sole of the boot usually held by springs (F). When tension becomes too great, the front throw (B) bends up so that E pivots out and the heel coil is also released. The small clasp (D) can be used to engage the heel coil and hold it firmly to the ski. This position is safer than the free heel position for fast downhill running; and the whole boot is still released in a major spill.

(*c*)



(*d*)

(*e*)

Fig. 45. (*c* & *d*). The Anderson & Thompson (Seattle) quick release cable binding. The cable is adjustable to any desired tension. Straps are provided to prevent loss of ski when binding releases. (*e*) The Hvam Saf-Ski binding invented by Hjalmar Hvam of Seattle replaces the conventional toe irons with a toggle cup into which the boot toe is forced by the tension of the heel cable. The grip is primarily by friction.

Lawrence E. Briggs, Massachusetts State College skiing expert, advocates the use of proficiency tests. He says, "The proper use of proficiency or achievement tests motivates ski safety interest. These tests are used to measure an individual's ski technique and ability. The Junior Committee of the National Ski Association, as well as the United States Eastern Amateur Ski Association, has worked out proficiency tests." [4]

Center for Safety Education, New York University

FIG. 46. LEARN TO FALL PROPERLY

If possible, when a fall is inevitable, the skier should fall backward and to the side as demonstrated here.

It is recommended that all ski areas designate the respective trails and slopes for beginners, intermediates, and experts, and that the various divisions of the National Ski Association classify skiers for these areas by means of proficiency tests. The awarding of proficiency badges to at least these three classifications, similar to the Red Cross Lifesaving program, would be very helpful.

Ski Tows. Ski tows can be dangerous. They should be mechanically sound and equipped with a safety gate and safety switch. Claire J. Bousquet says, "No skier should ride any tow

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[4] "Make Ski Safety a Must," *Safety Education*, December, 1946, p. 3.

until he knows it has a safety switch properly installed." [5] Following are several safety hints on the proper use of tows and lifts:

1. Tuck in all loose clothing ends before starting, and place poles on wrist of the outside arm. 2. Do not grasp the rope too firmly at the start; let it slide through the fingers slightly, then tighten grip. Try to gain a little momentum before grasping it firmly. 3. Grasp the rope with both hands. 4. On a J or T Bar lift, never sit, but lean against the stick. 5. One's muscles become cold when riding a chair lift, so it is advisable to wear an extra garment on the trip up, and enter the shelter and warm up before the trip down.

The National Ski Patrol. Undoubtedly the greatest force for safety in skiing in this country has been the National Ski Patrol founded in 1938 by Charles Minot Dole. Mr. Dole, who had suffered a severe accident, saw the need for an organized effort to prevent accidents and institute care for the injured if skiing was to afford healthful and stimulating recreation for the millions to come. There are now 295 registered patrols in the United States, composed of approximately 3,500 volunteer patrolmen. Their chief functions are to develop widespread education in safe skiing, render first-aid treatment to the injured, and make skiing conditions less hazardous and more enjoyable. Every skier is encouraged to join this movement and every good skier should volunteer his services. Even if a skier does not care to serve on a patrol it is advocated that he become a qualified first aider.

Specific Leadership and Skill Controls

Proper physical condition is of prime importance in avoiding ski accidents. A person who sits in an office all week is usually not in condition to withstand the rigors of skiing. Specially adapted exercises to help one get into skiing condition

[5] *Winter Sports,* January 2, 1947, p. 1. The January 23, 1947 issue contains a comprehensive article on the efficient and safe operation of ski tows by William Currier.

are available in many good books on the sport. Ski authorities are agreed that prospective skiers should participate in dry skiing before the season opens in order to condition themselves.

No one should attempt to learn to ski except under the guidance of an expert teacher. Going to a ski run with an enthusiastic group of amateurs all of whom volunteer to teach one is neither a sensible nor an economical method of taking up the sport. One will learn more quickly and safely under an experienced teacher. In few other sports does safety depend so much upon the mastering of the fundamental skills. One should avoid the common mistake of forming bad skiing habits and then seeking professional guidance. *A skier should not go down a slope until his instructor pronounces him ready.* One should know how to stop and turn before trying even novice slopes. It is also wise to learn to fall properly. When a fall is inevitable it should be backward and to the side. If the snow is crusted, the skier must be careful to protect his face from being cut.

National Ski Patrol

FIG. 47. FIRST-AID BELT—NATIONAL SKI PATROL

The first-aid belt which is carried by all National Ski Patrol members.

One should learn and observe the rules of the trail including the proper method of climbing, which is to keep to the side of the trail out of the way of the down-coming skiers. It is

extremely important to fill in all holes made by falls, for these "bathtubs" are one of the major hazards of a trail or slope. When planning to pass a slower skier on a trail, it is advisable to give him warning by calling "track left" or "track right," which signifies to him on which side you will pass. When a skier is warned by the use of the word "track," he should not dodge but should hold the same position until the skier has gone by. More than 80 per cent of ski-injury accidents are due to "going too fast for ability or conditions." *If he wishes to avoid injury, the skier must recognize his limitations and not attempt feats beyond his skill; he must avoid getting out of control.* The urge for "one more run" before leaving for home is often very strong, but it must be remembered that *fatigue is a major contributing factor to accidents.* A tired skier is subject to injury, more so possibly than participants in most other sports. Considerable evidence points to the fact that the majority of accidents occur during the late morning and late afternoon periods when skiers become fatigued. When skiing in a known avalanche country, one must adhere strictly to the rules, and follow the advice and warnings of local authorities.

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XII

SAFETY IN SPRING SPORTS

Moving Out of Doors Again. Spring brings the thrill of going outdoors again for sports participation. In many parts of the country this is a precarious move, because the vagaries of the weather add many hazards to some of the otherwise relatively harmless activities. For this reason baseball, often called the great American pastime, is especially handicapped in the northern states. Track and field participants meet with many injuries due to cold weather hazards, and other sports face other weather problems. Regardless of this, there are many magnificent days when almost the whole school turns out for sports. Archery, golf, horseback riding, lacrosse, and tennis all have their adherents, and each has its peculiar dangers. Horseback riding and lacrosse are the most hazardous, and neither sport has a proportionately large number of school participants. The following pages describe the hazards of these sports and the recommended procedures for their control.

Because play will occupy a large part of the student's vacation period, administrators are reminded that summer safety education should be stressed during the last few weeks of school. All levels will require instruction in water safety and camping, and in the lower grades playground safety instruction will be called for.

Archery

For thousands of years man used the bow and arrow to procure his food and wage his wars. Despite the fact that the bow and arrow were used so fundamentally for so long, it is

probable that no race of men produced so efficient a weapon or used it as skillfully as the modern archer. The feats of marksmanship of such modern Robin Hoods as Curtis Hill, Dr. Erwin Pletcher, Arthur Young, William Sterner, Alice Shafer, Ann Weber, Pat Chambers, and Milly Hill are amazing. The penetrating force of a hunting arrow is shown by shooting it through three feet of boxed sand into a target, whereas the bullet of a Garand rifle penetrates only to about a foot and a half.

Hunting with the Bow and Arrow. Each year thousands of archers hunt with bow and arrow. The state of Michigan alone issued 4,243 bow and arrow hunting licenses during 1946, and it was recorded by the president of the Michigan Archers Association that its members killed 120 deer. Hunting in this manner requires the huntsman to stalk his quarry more stealthily, which makes him quite liable to be shot by a "gun" hunter. Usually a bow and arrow hunting range is reserved for his use, but where it is not, the archer must take every precaution to distinguish himself as a hunter. Many archers refuse to hunt in any area except that reserved for their use. This is probably the only safe course to take.

For further details on safety in hunting, the reader is referred to page 239.

Target Archery. Target archery is potentially dangerous, but it has been so safely conducted in our schools that it is considered a rather safe sport. Lloyd and Eastwood found its incidence among college women to be only 1.1 accidents per 1,000 exposures, although it is considerably higher (3.5) among high schools, ranking eight among all sports. According to their statistics there are approximately 8,000 high-school participants and an estimated 7,300 college participants, largely girls and women. Ninety-two per cent of the injuries among college women were strains of the arm and hand, indicating an attempt to use bows which were too strong for them. Drawing with the finger and forearm muscles instead of the big back and shoulder muscles also causes such strains. The proper execution of the fundamental skills will prevent many of the common injuries occurring in archery.

Specific Administrative Controls

Adequate protection must be provided behind the targets and for all approaches. All approaches to the outdoor range should be fenced and have warning signs, or be policed during use. Indoors all doors must be locked on the inside, unless it would be in violation of the fire laws, with the range approachable only at the shooting line. Outdoors the best backstop is a hillside or embankment (see page 208 for proper construction of an archery range), whereas indoors a felt drop is most satisfactory. Baled straw must not be used indoors unless it is fireproofed. Where it is possible outdoors, the direction of flight should be north or northeast, which permits all day shooting without the sun's rays being in the archer's eyes.

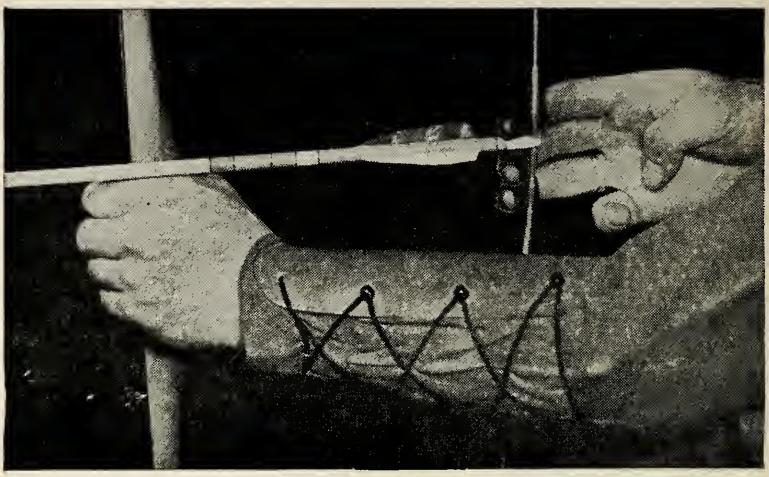
Only *good-quality bows and arrows* should be used. It is generally agreed that cheap, poor tackle should not be used. Coach Knute Law of the University of Illinois points out that only target arrows should be employed. Captain Mills of the Boy Scouts believes that "the important thing with the bow . . . is to determine that its design is correct or that it is properly tillered."

Leadership and Skill Controls

Control through organization is extremely important for safety in archery. A definite system of checking out equipment and making assignments to targets, as well as a correct order of shooting must be worked out to avoid the confusion which may result from promiscuous shooting. *All participants should shoot from the same line.* When different distances are required, the targets should be staggered and the archers remain on the same shooting line. *Participants should retrieve arrows at the same time* upon a signal from the instructor or designated leader. Instructors usually use a whistle to designate the time to retrieve arrows, and no participant should be allowed even a few steps beyond the shooting line or at the sides of the range before the signal.

Bow should never be drawn pointing toward another per-

son or persons. Although this precaution is an obvious one, it must be constantly emphasized, particularly with inexperienced participants. A nocked arrow is like a loaded gun, and a drawn bow without the arrow may break and injure the person in front of the bow.

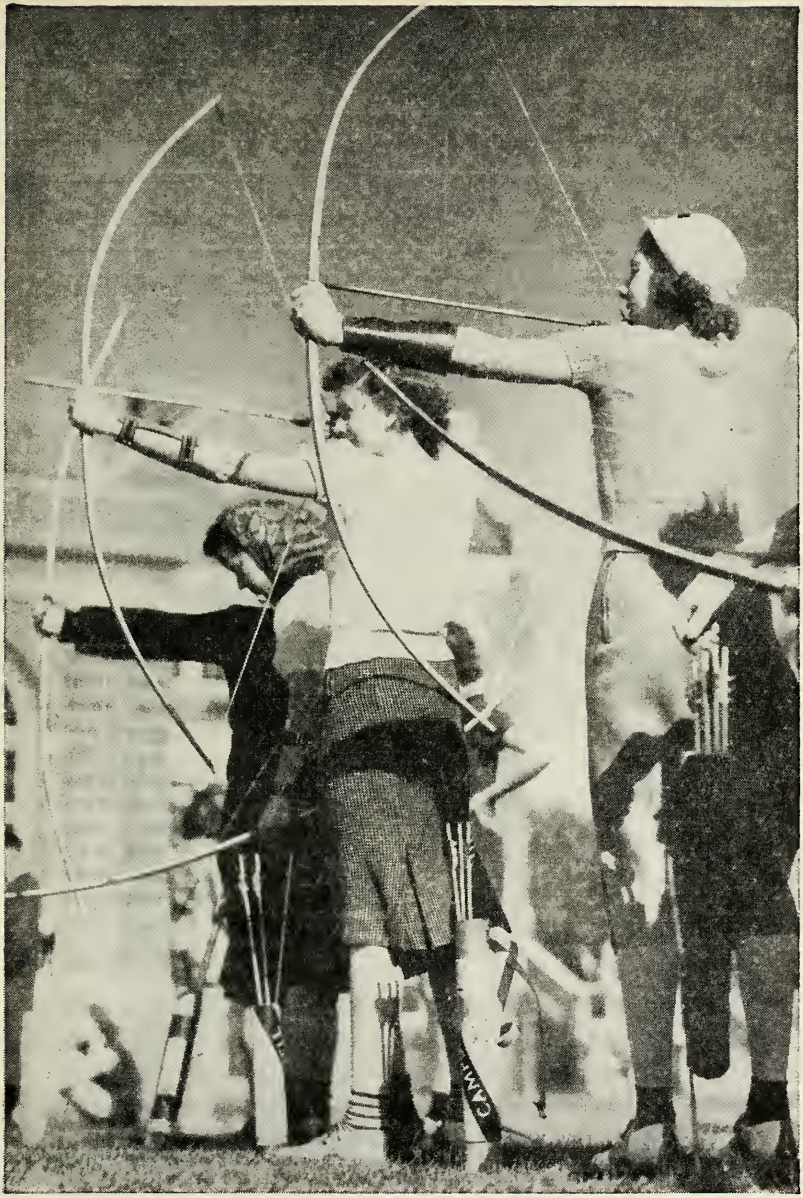


National Safety Council,
National Archery Association
NEA Journal

FIG. 48. ADEQUATE PROTECTIVE EQUIPMENT

Arm guards and finger tabs are essential protective equipment for *all* archers.

The arrows should be long enough for the normal draw of the user. The proper arrow lengths as recommended by the Official Sports Guide are indicated in Table XXII. Arrows should have heads slightly greater in diameter than the shafts. They not only stand more abuse but are not so likely to be overdrawn because the shooter can feel the rim of the pile against his hand. Arrows should be nocked *only after all archers have returned to the shooting line* and the signal is given to shoot. The only guarantee that an arrow will not be shot is to be sure that it is not nocked. A nocked arrow is like a loaded gun and just as dangerous. See that all participants learn this good habit in their first lesson.



Scholastic Coach

FIG. 49. ORGANIZED FOR SAFETY

Safety in mass instruction of archers depends to a large extent upon careful organization and strict adherence to the rules of conduct.

TABLE XXII

Determining Correct Arrow Length [1]

GIRLS			BOYS		
Height	*Arrow Length*	*Bow Weight*	*Height*	*Arrow Length*	*Bow Weight*
5′ to 5′2″	23″	18–24 lb.	5′ to 5′4″	24″	25–32 lb.
5′2″ to 5′4″	24″	18–24 lb.	5′4″ to 5′7″	25″	25–32 lb.
5′4″ to 5′6″	25″	18–24 lb.	5′7″ to 5′9″	26″	25–32 lb.
5′6″ to 5′8″	26″	18–24 lb.	5′9″ to 5′11″	27″	25–32 lb.
5′8″ to 5′11″	27″	18–24 lb.	5′11″ to 6′2″	28″	25–32 lb.

Care must be taken *not to overdraw the arrow.* It is obvious that this is a dangerous practice, and strong archers should be cautioned with regard to its consequences. The arrow may pierce the hand or shatter if it hits the bow and endanger the eyes and face as well as the hand and arm. It should be remembered that a bow fully drawn is nine-tenths broken. There is a new device, the "draw-check," available that attaches to the arrow rest and pops up when the arrow is drawn to full length. The bow and arrow *should be inspected* carefully for breaks and flaws *each time* before using. When the arrow cuts the hand, it may be due to the rough place where the narrow part of the feather joins the arrow. To prevent this injury, check the feather left of the cockfeather and smooth the front surface of the quill of the vain. Place a small piece of tape around the index finger of the bow hand to avoid further iritation. If the loop of the string is worn, it should be replaced, and if the serving at the point where the arrow is discharged is frayed or loose, it should also be replaced. Check the nock of the arrow to see that it is properly reinforced.

All participants should use arm protectors and finger tabs or gloves. It is recommended that the school provide such protective equipment, and that it be used at all times when participating in the sport. Those who hit the inner projection of the

[1] Mrs. Myrtle K. Miller, from *Official Individual Sports Guide* 1942–43, Copyright, 1942, by the National Section on Women's Athletics of the American Association for Health, Physical Education and Recreation. P. 37.

elbow with the string because of hyperextension should rotate the shooting arm inward and bend the elbow slightly.

At least four feet should be allowed between archers, and at least fifteen feet between targets. Some instructors believe this distance too short and recommend at least six feet between archers. This distance applies largely to indoor shooting where space may be at a premium. Out of doors the distance can be greater. *Archers should not face each other.* By this it is intended that a left-handed person can be placed at the end of the line so that he will not face another archer. For many years left-handed archers were not allowed to shoot in English tournaments because of the danger. It is understood, of course, that two lines of archers should never face each other while they are competing, nor even during instruction, if arrows are nocked. *Only one archer at a time should pull arrows from a target.* When more than one person is permitted to pull the arrows, there is danger of someone being poked in the eye. All except the one drawing should stand at one side of the target and in back of the archer. Girls should draw the string back close to the left arm, to avoid bowstrings striking left breast. If it is drawn only to the chin, the string will usually not strike the left breast. In case of an overweight girl, she should use a shorter bow so that the string will be at a sharper angle when drawn, or, rather than changing her style, she can wear a leather chest protector.

Additional Suggestions. 1. Archers should not be allowed to use bows that are too strong for them. 2. The arrow should be nocked at right angle to the string. 3. It is recommended that proper clothing be worn, because pockets with flaps, buttons, et cetera, are a hazard to safe shooting. 4. Field archery presents the added hazards of hunting, and archers taking up this sport should familiarize themselves with the necessary precautions. 5. College-age beginners ordinarily should not be allowed to practice with bows exceeding twenty pounds pull. 6. For safety's sake a keeper (hanging string between the nock and loop) should not be used, because when a bow breaks, the keeper usually causes a piece of the bow to hit the head.

The Archer's Safety Code [2]

I shall always remember that bows and arrows are not toys, but weapons capable of inflicting serious injury and death.

I shall never point an arrow (in a bow) at another person, even in sport.

I shall never attempt to demonstrate my skill by using a person as a target, or by permitting another to hold the object at which I shoot.

I shall never stand farther away from the target than others, so that I have to shoot over or past them, and I shall do all I can to prevent another archer from doing so.

I shall faithfully obey the starting and stopping signals when I shoot with others.

I shall never attempt to recover my own or another's arrows while someone is shooting, and I shall try to restrain others from so doing.

I shall call out, "Fast," before I loose on a field course, so that people about me may be warned.

I shall never leave my bow and arrows about unguarded where young or careless people can get their hands on them.

I shall never shoot unless I am certain that my target or its backstop will stop my arrow; and that there is no road in use or unpoliced area back of the target.

I shall never try to shoot far, except on a safe flight range; and I shall never shoot straight up into the air under any circumstances.

I shall warn others when I am about to test or demonstrate a bow; I shall draw with an unnocked arrow of safe length toward a solid wall.

I shall never shoot, or permit others to shoot, with a splintered arrow or one that I think unsafe, or with a bow badly out of balance, or with a bowstring unserved.

I shall never brace another's bow without his permission, and I shall never draw it under any circumstances.

I shall respect all bows and arrows, and I shall give my own careful, correct treatment at all times.

In Short

I shall never take chances or skylark with a bow and arrow.

---

[2] *Safety Rules and Regulations for Archery Use in the Boys and Girls Camps,* Maine Development Commission, Augusta, Maine.

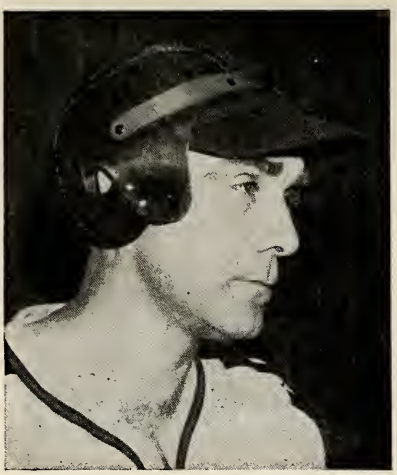
I shall seek to make known the safety rules of archery, and I shall work for archery safety in every way I can.

I shall be a good sport, and I shall obey promptly if I am told to stop shooting for the infraction of any of these rules.

Baseball and Softball

Although Cooperstown, New York is is popularly known as the birthplace of baseball (1839) and Abner Doubleday as its creator, evidence points to an earlier development. V. V. Parma, curator of the Congressional Library's rare books, disclosed in the New York Times, in 1939, that an early school volume entitled *A Little Pretty Pocket-book,* printed in 1787, contained a poem entitled "Base-ball." Alexander Cartwright was actually the originator of the diamond in 1845, and the first nine-man game was played between the New York Knickerbockers and the New York Nine at Hoboken, New Jersey. The various elements of the game were brought from England where rounders, cricket, and hand- or wall-ball were popular for many decades. The first official rules drawn up by Cartwright and his associates of the Knickerbockers in 1846 abolished the dangerous practice of "burning" (hitting with the ball) the base runner between bases. The popularity of the "New York" game grew until the National League was formed in 1876, and the American Association in 1882. The first intercollegiate game was played July 1, 1859 between Williams and Amherst Colleges at Pittsfield, Massachusetts, with thirteen players on each side.

School Baseball. Despite the fact that hard baseball has been considered our national sport, its popularity among schools and colleges has been replaced largely by the softball variety. In fact, the Physical Education Curriculum Research Committee of the College Physical Education Association recommends that hardball be discontinued in physical education classes. Since the nature of the games and safety precautions are similar, the two are considered simultaneously in this work. The 767,000 high-school and 202,000 college participants in baseball would not indicate any decline in popularity, and Menke in his *Encyclopedia of Sports* says softball has more players and draws



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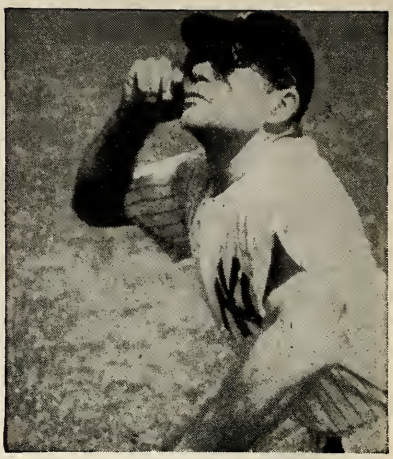


c. Ethan Allen, Scholastic Coach

b. Drawings by Georgia Portman

FIG. 50. BASEBALL SAFETY DEVICES

(*a.*) Equipped against Bean Balls. Jackie Hayes, Chicago White Sox second baseman, used this headgear as protection at the plate. (*b.*) This baseball helmet, designed by the late Dr. Dandy of Baltimore, is being used by many Big League teams for cranial protection. Notice that the protection is provided only at the vital spots, the top of the cranium not needing protection. The cap does not appear any different from regular caps when it is worn. (*c.*) Charley Keller of the Yankees lowers his sun glasses into place to prepare for a catch in the sun field. They are of shatterproof glass.

more spectators than any other sport in the world. Baseball ranks low in the degree of hazardousness among all school levels, whereas softball ranks high for high-school boys, very low for college men and a little higher for college women.

Accidents and Causes. As would be expected in both sports the arm and hand, leg and foot, head and neck are the parts most frequently injured, accounting for more than 90 per cent of the injuries. Almost all head and neck injuries are

caused by careless throwing of the bat and collisions between the base runner and baseman. Uneven playing surfaces and base sliding cause most of the leg injuries.

Specific Administrative Controls

It is recommended that all baseball players be provided with, and use, cranial protective helmets, especially while they are at bat. A few fatalities and numerous serious head injuries caused by the "bean ball" led to the development of baseball helmets. These plastic "skull caps," invented by the late Dr. Dandy of Baltimore, are worn beneath the regular cap and furnish excellent protection from a thrown ball or bat, collision with other players or obstacles, and spiking. They have proved quite successful and are used by many big league teams, among them the Brooklyn Dodgers, the New York Yankees, and the St. Louis Cardinals. Some players wear them continuously during play, and others wear them only at bat or when they are base running. Because of their expense many teams use helmets for batting only. Mass production may place them within the reach of all players.

Smooth-seam or concealed-stitch softballs should be used, twelve-inch in high school and college, fourteen-inch in elementary school. There may not be much difference in the hazard of using the exteriorly raised-seam softball, but there seems to be very little justification for *not* using the smooth-seam type. Some instructors prefer the use of the twelve-inch ball in the elementary school, particularly in the lower grades, because the size fits the smaller hands of the children better, but because it is much harder than the larger ball, it is considered more dangerous. Partially for this reason, most schools do not include regular baseball in the physical education program. The size of the playing area also governs the size of the ball to be used.

Bases should be of regulation filled heavy canvas. Stones, trees, or sides of buildings, should *not* be used for this purpose. The use of trees and sides of buildings is particularly dangerous, and no instructor should be guilty of permitting such a hazardous practice. If regulation bases cannot be provided,

homemade ones can be easily improvised. In order to eliminate the hazard of toe-catching, some instructors advocate that bases be left untied, which would prevent toe-catching sliding accidents. The rules call for marking the position of the base and tying it down with an iron stake, a small loop at the top being bent over at a right angle. When driven deeply into the ground, such a stake does not present a hazard to base runners. The home plate, of course, should be of rubber. It is usually necessary to screw the rubber plate on to a wooden one to keep it from warping. The dirt should be kept flush with the plate at all times to prevent stepping into the hole, and turning an ankle or hitting the plate with the thigh. Indoor bases are best designated by painted or chalked lines.

Bats should have nonslip grips of tape, cork, or other material. Although the official softball rules include this precaution, it is repeated here because many instructors are not thoroughly familiar with the rules and permit the use of nonwrapped bats. Aluminum bats proved quite successful for class work before the War and may become very popular when they are again on the market. Their use eliminates almost entirely the danger of breaking.

Spikes should not be allowed for physical education class play or intramural games unless all players wear them. It is recommended that the same rule apply for interschool competition. ". . . it would seem desirable for schools to provide spiked shoes for their players, as the spikes, if skillfully used, should prevent accidents by insuring a more secure footing." [3] Homer Allen reports that the use of golf shoes is encouraged among college intramural players at Purdue, where their use seemed to decrease the number of injuries. Danford in the recommendations following his survey, recommended the elimination of the metal cleat and the substitution of a hard rubber cleat for hardball play. Nonshatter sunglasses should be provided for the outfielder in the sun field. Such glasses are commonly used for regular baseball, but only the highly organized softball teams representing commercial leagues have used them

[3] Howard G. Danford, "Safe at All Bases," *Safety Education,* May, 1939.

to any great extent. Much of softball competition takes place at night under lights where this precaution is unnecessary. When no glasses are worn, the player should shade his eyes with his glove while the ball is aloft.

Playing areas and areas for use of "on deck" batters and coaches should be marked and no other players should be allowed in or near them. This regulation is difficult to enforce, but it is so important that every coach and instructor should insist upon compliance. It is recommended that players'

Chicago Public Schools
National Safety Council

FIG. 51. DON'T THROW THE BAT

The device shown above, a loop about the wrist attached to the bat, is a good method of controlling the bat for indoor play. For outdoor class play it is recommended that an area be designated in which the bat must be deposited or an out called.

benches be provided, that they be placed behind the screens or at least thirty feet from home base and base lines, and that players be confined to these benches when not at play. Much of the danger from this violation in physical education classes arises when several games are in progress on diamonds which do not provide players' benches or screens for protection. Under these circumstances, the instructor is advised to redouble his efforts to enforce *all* safety precautions. Because most players are right-handed, the awaiting batters should line up on the right side of the plate sufficiently far away for safety. Because of the large number of injuries received by players running into fences and walls surrounding the baseball field, the Brooklyn Dodgers have padded all such surfaces with rubber. Other clubs and schools should consider providing this safety precaution which has proved quite satisfactory.

Specific Leadership and Skill Controls

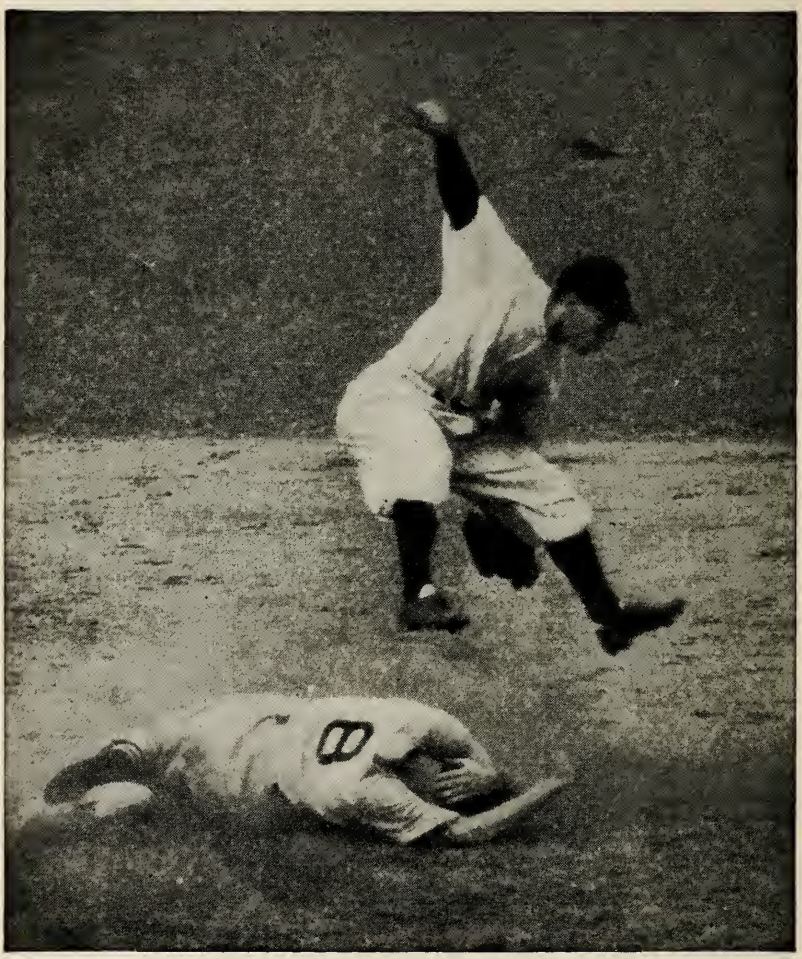
Batting. The batter should grip the bat firmly and keep his hands dry to prevent slipping. To the inexperienced teacher or coach this may seem a useless admonition, but the experienced person knows that class members must constantly be reminded of the dangers of letting the bat slip, or of throwing it. Throwing the bat outside a given area should be an "*out*" in physical education classes. This method of control has proved satisfactory in many schools and is recommended here as a partial answer to that ever-present threat of the thrown bat. A circle or square can be drawn for this purpose about fifteen feet down and outside the first base line. A number of persons in the past have advocated the use of a leather loop on the handle of the bat, through which the batter could place his one hand and carry the bat to base or discard it carefully on the way, but instructors in general found the practice impractical and quite distasteful to the players. This device does possess the unquestioned advantage of preventing the bat from slipping while swinging and flying through the air, which often causes severe injury to bystanders. On the other hand, the possibility of the batter injuring himself is enhanced. This system

may be necessary for indoor games where the hazard is greatest. It is necessary to practice proper disposal of the bat before allowing youngsters to play. The guiding hand should be kept away from the hitting surface in bunting. This precaution applies largely to hardball, where the danger is greatest.

The batter should not crowd the plate or jump around asking to be dusted off, and should not hesitate to duck when necessary. Batting is a game of skill between the batter and the pitcher in which psychology plays a considerable role, but players who attempt to rattle the pitcher by the above tactics are courting danger. The batter should step out of the batter's box on plays at the plate. Although this precaution is incorporated in the rules, it is mentioned here because youngsters are likely to forget in the excitement of the game if they are not cautioned often. It is customary to hold that the batter's box is for the batter, and that it is part of the game for the catcher to get around him to throw, but in class play it may be advisable to instruct the batter to duck or step out of the way.

Catching and Fielding. Catcher should keep his bare hand closed or away from the mitt until the ball strikes the mitt. The injury of the split finger has been one of the most feared accidents in baseball. A recent World Series saw one of the regular catchers retired from the Series for this reason. In softball, the catcher should wear a mask and possibly a chest protector. This protective equipment is not necessary, of course, when the catcher acts merely as a "pig tail," but when he stands in the regular position and hard pitching is used, he should be so protected. The chest protector is often unwisely omitted. Girls should always wear one, especially when catching close behind the plate. It goes without saying that the hardball catcher would not be so foolhardy as to get behind the plate without this protection, plus shinguards. In catching the ball, the player should have his fingers pointed either up or down, never toward the ball. This fundamental is a safety precaution which is mentioned here as a reminder of its significance. As every instructor knows, this simple rule is difficult to put across among beginners. To avoid being hit by the bat, the catcher

should not crowd the batter. A catcher is usually of the fearless type, or he wouldn't be behind the plate, so often it becomes necessary to caution him not to crowd the batter. The catcher must also take the brunt of the base runner's "do or die" spirit,



Acme Photos

FIG. 52. INJURED BY THROW TO SECOND

Wagner, Boston Catcher, is injured when hit by the ball on a throw to second base where Rizzuto, the Yankee player, sportingly and spectacularly avoids spiking him. Following injuries of this nature to the head, physicians usually place the player under observation for a day or so.

because he guards the home plate. If possible, he should tag the runner without "drawing" his spikes. Usually, however, he must assume a sturdy, crouched position and be ready for the "assault." Coaches say: "Select a position that will cause the runner to tag himself."

The eyes should be kept on the ball and hands out in front when a grounder is being fielded. This is a universal coaching hint that serves not only as an accepted method of fielding the ball, but of protecting one's self from bad bounces. One of the coach's most difficult tasks is to prevent his infielders from becoming "ball shy" following an injury because of a bad bounce.

A player should call for a fly ball to avoid collision. Even the big league players occasionally err on this point, and it is listed here to remind teachers that class players often make this mistake. It is wise to select a captain or some player to designate the proper recipient for the infield, and outfielders must call their own. Players should not take unwarranted chances in chasing foul balls. Many youngsters take great pride in their daring when chasing fly balls. It is an admirable quality when not carried to extremes. Usually fellow players will warn the chaser of approaching danger, and he can govern himself accordingly.

After each pitch the pitcher should keep hands out in front and be ready otherwise for a line drive so that he will not have to "duck." This precaution applies primarily to hardball. The pitcher should assume a "ready" position and keep his eyes on the ball, because when it is batted, it often returns too fast for him to duck.

Base running. Sliding probably causes more baseball injuries than any other single act. Although proper techniques of sliding could eliminate many such injuries, it is questionable whether the vast majority could be eliminated. Coach Butler says, "I believe most of the injuries that occur in sliding are caused by (1) last second changes in the plans of the baserunner, (2) incorrect sliding technique and insufficient practice, and (3) a fear of sliding which causes indecision and tightness at a time when the baserunner should be decisive and relaxed." Physi-

cal education class players ordinarily cannot be supplied with proper sliding pads, which are often necessary, nor is the outcome of the game so vital as to justify the risk taken. *The head-first slide should be prohibited* except for varsity players returning to base. Physical education class players should not be permitted to slide in any fashion at any time. Among the coaches questioned on this item, Miriam Anderson said she thought that even physical education participants should be taught to slide correctly. Mackie thought head-first slides could be permitted safely in advanced classes. Earl Vaughn pointed out that players with "bad" knees *should* slide head first.

The base man should give the base runner ample space on the base. Here, again, good sportsmanship, as well as the rules of the game, must govern. The base runner should stay as close as possible to the base line but avoid fielders. In other words, the base lines are there to guide the base runner, and by sticking as close as possible to them he not only cuts down the distance to be traveled, but may avoid collision with an infielder.

When sliding is permitted, all players should wear *sliding pads.* Hip and thigh pads should be worn. Turkish towels fastened inside the trouser legs will serve in lieu of regular sliding pads. The base runner (varsity) should make up his mind whether to hook-slide or not and abide by that decision; changing his mind may cause injury. This mistake has been accepted as a common cause of injury in sliding, and the successful coach will drive this idea home to his base runners if such accidents are to be avoided. When executing a hook-slide, the base runner (varsity) should be partially relaxed, keeping toes up and arms in the air. Each coach has his own special precautions for avoiding injuries while sliding. These are merely suggestive of the various methods in use. It is wise to spend the time necessary to perfect sliding. Most schools provide sawdust pits for this purpose. Some coaches utilize rainy days, when the ground is soft, to teach the proper techniques. *The base runner (varsity) should not slide into base with spikes high.*

Additional Suggestions by Coaches. Andreas recom-

mends restraining the spectators at least thirty feet from the foul lines by the use of lines, ropes, fences, or wire screens. Butler suggest that the stakes which mark the bases should be kept flush with the ground. Mrs. Mackie recommends the use of the fourteen-inch ball in high school for the less proficient girls. Patricia Baron believes that sliding among girls should be governed only by the condition of the diamond and the skill of the players. Danford reminds us that when a mask is not available, the catcher should stand far enough away from the plate to catch the ball on the first bounce. He remarks also that good leadership will curb children in their desire to throw balls and swing on the bars promiscuously, and makes the following suggestions about overcrowding:

> School and recreation leaders are often faced with the problem of conducting softball games on play areas too small for safe play or so crowded with children that every time a ball is batted out of the infield it endangers those playing other games. If the congested conditions cannot be relieved by an intelligent readjustment of playground schedules, it is possible to improve it in a number of ways: (1) Locate the small children's play area out of reach of batted balls. (2) Use a larger and softer ball, thus reducing the batting range. 3) Relocate the ball diamonds so that children playing on apparatus will not be endangered by batted balls. If swings are in use on the playground, care should be taken to locate the diamonds as far away from these as possible, so that players running to recover balls will not present targets for a flying swing. In general it is best to locate the home plate near the outskirts of the play area and bat toward the center.[4]

Crew

The time-worn belief that crew members die early in life due to overexertion and overdevelopment of the heart has been scientifically disproved on many fronts. Surprisingly, however, rowing was found by Eastwood to be a highly hazardous sport. He reports the accident incidence to be 5.3 per 1,000 exposures, ranking sixth among college sports for men. Hand injuries

[4] "Safe at All Bases."

accounted for the majority of mishaps, and muscle strains for most of the remainder.

Specific Administrative Controls

In addition to the regular pre-season physical examination, at least one *check of the heart and lungs* of all candidates should be made by a competent physician during the season. Most coaches polled on this point agreed with the principle, but some thought it wise to check more often, especially where the season extended over a prolonged period. Pocock, crew coach at Yale recommends at least two check-ups during the season, whereas Sanford of Cornell expresses a different view:

> If a boy is pronounced physically fit by a competent physician just before going out for crew, there is nothing in a normal course of rowing that should be detrimental to a sound heart and lungs. The danger comes after the season is over. The heart has been geared to the excellent physical condition of the entire body, and the boy should be cautioned to 'taper off' with lighter physical exercises to prevent tissues from going to unhealthy fat. I would recommend periodic examinations for possibly six months after the end of a rowing season.

All crew candidates should be given a *swimming test* before the start of the season, and only qualified swimmers permitted on the water. The extent of this test varies among coaches. Some recommend competence in the various Red Cross tests, whereas others such as Pocock believe the 100-yard test sufficient. All are of the opinion that crewmen should be qualified swimmers, largely because it gives the men a sense of security and prevents panic in case of swamping. On the other hand, most coaches agree with Sanford who says that the boys should be taught to stay with the swamped shell, which will support them until rescuers arrive.

Chamois or soft leather rowing shoes are recommended as protection against splinters on wet decks. Most coaches questioned preferred the chamois or leather shoes, but some pointed out that although they are better protection against splinters,

they are more slippery than socks for use on wet decks. The decks of the slips and boathouse should be inspected regularly for splinters, nails, and loose or rotten boards that might cause injury. These inspections should be in addition to regular semi-annual physical education plant inspections. Probably a specific caretaker should be assigned this additional task, especially if the docks are rather old.

Specific Leadership and Skill Controls

Only one crew should occupy a slip at a time, unless facilities are unusually large and more can be handled with safety. The shell should be taken out and placed in the water in rhythm, every one at once, to avoid strain. Care must be taken in carrying the shell on wet surfaces and in windy weather. It should be carried with keel into the wind to prevent a blow-over. Sanford also recommends carrying the shell at arm's length under these conditions instead of on the shoulders.

The slide stops should be properly designed and adjusted to prevent skin breaks and infection to the calves of the legs. If this is not possible, a protective covering of the leg should be provided. There should be vigilant and intelligent policing of practice and races by following referee's and coaches' launches to rescue members of the crew from a swamped shell, especially in rough weather. Special rules of the road should be formulated and observed, especially in crowded areas, to lessen the danger of craft colliding with one another or with special course hazards, such as pier abutments, bridges and so on. Each locale will have its own rules of the road which crews will be trained to observe.

When "catching a crab," the oarsmen should let the oar handle ride over the body to avoid possible injury. "When an oarsman catches a crab it happens so quickly that it is next to impossible to control the oar. However, if he cannot control it he should let the handle ride over the body, recover control as quickly as possible, and continue with the rowing." In rough water, the oarsman must learn to "feel" his position in order to avoid possible sacroiliac strain.

As in other sports requiring a high degree of physical condition, it is necessary for the coaching staff to be extremely skillful in the proper conditioning of the crew members if strains and other injuries are to be avoided. Jordan points out that the amount of work the oarsmen should do should be governed by the general physical condition of each athlete and how he responds to training, secondly by weather conditions, and lastly by the men's adherence to training regulations. Hamilton Bissell, crew coach at Phillips-Exeter adds: "No crew should perform at anything near top speed or power early in the workout." Several coaches point out the necessity for sweat clothes in cold weather and cap shades in hot weather. At Cornell they provide long-tailed woolen shirts to cover the lower back and water-repellent windbreakers when crews are forced to row in inclement weather. After a hard row in hot weather, salt pills are also provided. Most schools provide the usual weight chart, and coaches follow it very closely in planning conditioning of their men.

Additional Suggestions. Most coaches want a solution to their problem of hand blisters. Hygienic and sanitation suggestions are not considered to be within the realm of this treatise on accident prevention. Some borderline examples of this nature made by coaches are: Oar handles should be washed with a strong soap each day. Particular care should be taken to caution crewmen against the danger of infected hands due to neglect of blisters in early season work. "We have had innumerable casualties from blisters."

Golf

Since there are over 3,500,000 golfers in the United States, it is surprising that there are not more golf accidents. One reads occasionally of a person being seriously injured when struck by a hard-driven ball or by the backswing of a club, but such accidents are surprisingly rare. Mass instruction, which has become quite popular on the college level, does not produce many injuries either, probably because the organization and supervision are careful and thorough. The sport ranks

very low on the hazardous list, probably because it has always been a gentleman's game, and the rules of etiquette are nothing more than rules of safety.

Specific Controls

Observance of the general rules and courtesies of the game will prevent most golf accidents. Such rules of the game as calling "Fore," loudly before hitting the ball, waiting for the preceding foursome to hit their second ball and move out of range, and not approaching the green until the players have left the green are examples of the rules of etiquette that serve as safety measures. A Chicago golfer lost a court case because he shouted "Fore" *after* hitting the ball. It is recommended that all class instruction be preceded by thorough instruction in the rules of etiquette of the game before playing is permitted.

Care must be taken in practice swinging of clubs, especially around the tees, because of the danger of striking others. The player should make certain that no one is immediately behind him before swinging. This precaution is particularly apropos

Scholastic Coach

FIG. 53. MASS INSTRUCTION IN GOLF CAN BE EFFECTIVE—AND HAZARDOUS

When large numbers are taught, especially rigid rules of conduct must be observed. Here, plenty of space has been provided, and the danger therefore minimized.

for class instruction and should be remembered by all players at all times. The instructor should permit club swinging only

in class formation. When practice nets are used, no player other than the shooter should be allowed in the net. The net area should be free of obstacles which might cause the ball to rebound, and the net should be kept in repair to prevent balls from flying through.

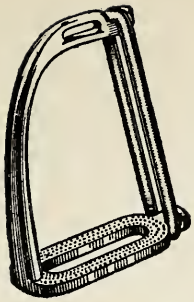
It is not advisable to play golf during lightning storms. Steel-shafted clubs are an especial attraction to lightning. Golf umbrellas should have wooden shafts for this reason. Golfers who insist on playing should avoid high places, tall or "lonesome" trees, and wire fences.

Horseback Riding

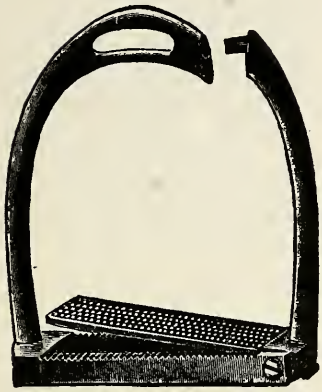
The automobile has not succeeded in eliminating the horse entirely. Many people still find recreation and even a livelihood in riding horseback. Despite the great social changes accompanying the adoption of the motor car, the horse remains the same challenging animal to ride that he always has been. Learning to ride and control a horse may be more hazardous than learning to drive a car. This is another sport in which *the beginner must learn under an experienced teacher.*

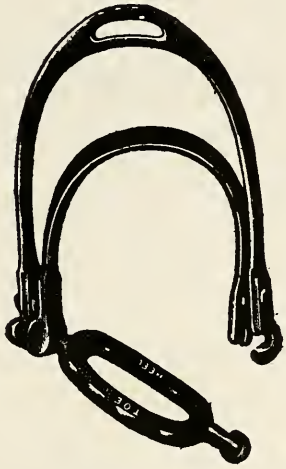
As a sport, horseback riding is most popular in cities where people apparently feel the need of riding in the country or open spaces for their pleasure. There are no records to show how many equestrians there are in this country, but the number must be high, and if one follows newspaper accounts, one would conclude that the number of people injured while riding is also high.

A College Sport. Horseback riding is most popular among college women. In all probability it is not because the sport ranks high as a hazardous activity that it is not used more extensively in high-school programs, but rather because of the expense and difficulty of procuring and utilizing horses. This is almost the only sport of the school physical education program that involves the use of "equipment" that is alive and unpredictable. Even an experienced horseman cannot be certain what the next action of a horse will be, which makes riding a precarious activity.



The Army and many commercial stables now provide some type of safety stirrup for beginners. When the rider is thrown, the stirrup releases itself if a foot is caught.





Stalker Manufacturing Co.

FIG. 54. SAFETY STIRRUPS

Eastwood found it to be the second most hazardous activity in the college physical education program for women. Sprains and strains to the leg and foot comprised 32 per cent of the injuries. Back injuries ranked next with 23 per cent, more than half of which were strains. Almost all injuries were the result of being thrown from the horse.

Specific Administrative Controls·

If the school does not operate its own stable, the commercial stable should be carefully selected for quality of horses, reliability, and integrity. When a stable is selected, the safety of the

students should be the paramount consideration. One factor which has kept this enjoyable sport from becoming more popular is a dubious feeling among parents about safety on horseback. The horse should be carefully selected and trained. When the school maintains its own stables, this problem is largely one of original selection, but where a commercial stable is used, the instructor must work diligently to secure only those mounts which are sound, tractable, and safe for students of varying abilities.

Instruction for all beginners should be given within a well-constructed and carefully kept riding ring.

> While an enclosed arena is highly desirable as a place to ride, it is not an absolute necessity. However, a fenced-in ring is. The fence may be of various types of boards or rustic rails, but never of wire, either woven or otherwise. A fence made of two planks, either fencing planks or two-by-fours, placed on posts about four feet high, is very satisfactory. The ring should be oval in shape, with wide turns. One-hundred-twenty feet wide by two-hundred feet long gives room enough to work a class, and yet is not so large that your riders get out of control.[5]

When these facilities cannot be provided, individual instruction on the trail can be used.

Saddles with *safety releases for the stirrups should be used by all riders.* Unfortunately, only the expensive English style saddles are equipped with safety bars for the release of the stirrup strap in case the rider is thrown and caught in the stirrup. There are two types of releases, the closed type, which should be used by beginners, and the open type which is best for advanced riders. The closed-bar type must be kept well oiled and workable or it is valueless. To date, an English manufacturer is the only one to produce a satisfactory safety-type stirrup with the release in the stirrup itself. The Army and some of the better commercial stables use these various safety stirrups successfully. All riding schools should provide the type

[5] Mrs. Claude H. Drew, "Teaching Beginners to Ride." From *Official Individual Sports Guide* 1942–43, Copyright, 1942, by The National Section on Women's Athletics of the American Association for Health, Physical Education and Recreation. P. 90.

best suited to the needs of their students. Riding boots with safety-toes are desirable for all riders. The hunter's safety helmet may also be used by beginners for added protection.

The instructor should carry first-aid equipment on all rides. This applies, of course, only to those rides that require leaving the accessible vicinity of a first-aid supply source.

a

b *Mrs. Claude H. Drew, Christian College*

FIG. 55. SAFE METHOD OF CROSSING HIGHWAY

(*a*) Horses are in line on the shoulder of the highway waiting for an opportunity to cross together. (*b*) Upon signal from the instructor, all riders turn their horses in a flank movement and all cross in the same time that it takes one rider to cross.

Bridle paths should not cross highways. When this is unavoidable, signs and signals should be provided, and a traffic officer may be necessary on heavily traveled highways. Each rider should demonstrate satisfactory skill in handling a horse before being permitted to go on trips of any length, especially when it is necessary to cross traffic or meet automobiles. It may be possible to cross a highway the following way: have all riders in single file cross a highway by making a flank turn so that every horse crosses at the same time and in the same length of time that it takes one horse to cross (see illustration). Beginners should dismount and lead the horse across slippery or heavily traveled highways. This precaution may be necessary under very unfavorable conditions. Pearl Lowery of Mount Vernon, New York, points out that this procedure may some-

times be more dangerous than riding across, especially if the students have not been thoroughly instructed and practiced in the proper methods of leading a horse. Riders should be warned never to stop a horse quickly on pavement. If a horse shies, he should not be jerked up quickly but worked around off the pavement and stopped.

When it is necessary to travel on the highway, local and state traffic rules must govern the riding. *It is safest, and is usually the law, to ride the right-hand side on the road shoulder when possible.* This places a vacant lane between the horse and the oncoming traffic. Horses are more afraid of the vehicles they see than those they do not see coming from the rear. To cross bridges, traffic must be stopped until the horses have crossed.

Bridle paths should be inspected regularly for the hazards of low tree limbs, holes, rocks, and so on, also for those things that might scare the horse. Grooms, who are often given the task of exercising the horses, could be assigned this responsibility. Riders should also be encouraged to report unusual conditions.

Smoking in the stables or about the premises should be prohibited. Since approximately 67,000 fires are caused yearly by careless smokers, and since stables are notoriously inflammable, too much care cannot be taken to protect the premises and horses against this devastating scourge. The stable should also have adequate fire-fighting equipment available. The phone number of the school physician and others should be posted in the stable where a phone should always be available. Because stables are often situated in rather remote and inaccessible localities, this precaution is a pertinent one. Although most injuries can be adequately treated by first aid and the victim transported safely to medical aid, an occasional accident may result in such serious injuries that medical assistance must be secured hurriedly, and the telephone becomes indispensable.

Specific Leadership and Skill Controls

The riding instructor should know the gaits and temperament of every horse used and the abilities and idiosyncracies of

every rider, and should make selections accordingly. This ability of the instructor is probably the most important safety factor in the teaching of riding. Mrs. Drew recommends a further safeguard of having the horses exercised by the grooms before each beginner's class is taken out.

Before mounting, the rider should recheck the cinch,

Mrs. Claude H. Drew, Christian College

FIG. 56. CONTROL FOR BEGINNERS

A safe method of teaching beginners is employed at Christian College. A student leader or assistant instructor leads the first beginner's horse around the ring until they reach the rear of the line. The second in line is another assistant who holds the line until the same procedure is followed with the next equestrian, and so on until the lesson has been completed.

bridle, and stirrups for safety. The instructor will probably want to do this for the beginners until they have learned the

proper methods of checking. The checklist will include inspection for the condition and adjustment of all fastenings, such as ropes, rings, buckles, straps, stirrups, curb chain, bit, and reins. Most horses bloat when the saddle girth is first fastened, so that it is usually too loose and needs adjustment before mounting. It is assumed that the instructor or groom will make certain that the horses are well shod before allowing them to be used. The horse should be held for the mounting and dismounting of a beginner until he or she has mastered the technique and acquired sufficient confidence to mount or dismount without assistance. Mrs. Drew, of Christian College, relates the following method of mounting and dismounting safely:

> Now the rider is allowed to mount. The method of mounting we use has been tried out and, to our way of thinking, provides maximum safety to rider and comfort to horse. First, the rider stands with back to horse's head, fairly close to the left shoulder; reins are gathered in left hand, with right hand reins slightly tighter. (This detail makes it easier to avoid being stepped on by the mount, because he will step to the right if his head is turned slightly to that side.) The right hand steadies the stirrup and turns it a quarter turn to face the rider. Then the left foot is placed well in the stirrup with toe pointed down, and the left hand, together with the reins, is placed firmly on the horse's withers. Now the right hand grasps the cantle of the saddle, and when the weight is transferred to left foot, the right foot becomes a lever to propel the body upward. It is an easy matter to place the body in the center of the saddle by swinging the right leg over the horse's back and quietly finding the right stirrup after the right hand has been transferred from cantle to pommel of the saddle. To dismount the process is exactly reversed. The rider steps down on the ground with the right foot, and the left will automatically leave the stirrup.[6]

Beginners should be taught not to approach mount from the rear, and to make their presence known by speaking if it is necessary to do so. By not observing this age-old safeguard, many persons have suffered severe injury from being kicked.

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[6] *Official Individual Sports Guide* 1942–43, Copyright, 1942, by The National Section on Women's Athletics of the American Association for Health, Physical Education and Recreation. P. 90.

The rider must be taught the safe use of the stirrups. Adjustment of the stirrup straps to the proper length for each individual is essential. The proper placement of the foot, so that it can be released if rider is thrown, is also of paramount importance, because the most serious accidents are those in which the rider is dragged by the horse. Beginners should be taught the correct method of breaking a fall when they are thrown. This is much easier said than done. The fundamentals of correct falling, however, should be taught in all tumbling classes, and equestrians could be enrolled in these classes to learn the techniques. In addition, riding instructors have usually learned many little devices for safety which can be passed on to the students to improve their security. June Foote, University of Illinois Physical Education Instructor, says: "Better psychologically not to discuss falls with beginners; they will be more relaxed."

Beginners should not be allowed to use a riding crop or spurs. As the beginners progress, it may be part of their learning process to master the use of those aids. Miss Foote says a crop is necessary on certain horses and will facilitate beginners' learning, provided the instructor knows her horses. Mrs. Drew says she does not allow any rider to use spurs, and only advanced riders to use a crop on sluggish horses. Confidence and relaxation are major essentials for safe riding. Building confidence is probably the instructor's most difficult task. Relaxation depends to a large extent upon one's confidence. Since the rider's security depends to a large extent upon the mastery of both, the prudent instructor will devote much of her time and effort to this instruction.

If one rider is having trouble, every other rider should be instructed to *stop his or her horse and stand quietly.* In most cases a horse that is out of control because rider has lost balance, or the reins, or a stirrup, will stop before he loses his rider. In rides of persons of mixed abilities, experienced riders should lead and follow up the rear. If two instructors are available, they should fill these positions. When only one is present he or she should lead to set the pace to conform to the ability of the

poorest rider. Groups should not exceed twelve in number. They should ride in singles or double file, with approximately a horse's length between and relay the news of trouble to the instructors when necessary. Trails which are safe for the skill of the groups should be selected.

Additional Suggestions by Riding Instructors. 1. Riding after dark is more hazardous and should be avoided by the inexperienced. 2. Stunt and trick riding should not be permitted as part of the school program. 3. For beginners, twenty to forty minutes is sufficient riding time; for inexperienced riders, from forty-five minutes to an hour and a half is sufficient; for experienced riders an hour and a half to three hours. 4. Occasional dismounting and walking for short distances, leading the horses, helps prevent lameness and saddle chaffing for riders who are not hardened to the saddle. 5. Jokes played on riders or horses are out of place, especially as far as new riders are concerned. 6. If a horse runs away, the rider should bend every effort to stay up and keep him running in a circle, making the circle ever smaller if terrain permits.

Lacrosse

Lacrosse is the only team game which we have taken from the American Indians, and is therefore the oldest organized sport in America. It is a picturesque but rugged game that is played by relatively few schools. There are approximately 36,000 college participants and only 2,300 high-school players, most of them located on the eastern seaboard. As surprising as it may seem to some, there is a United States Women's Lacrosse Association, with fifty affiliated schools and colleges.

To the uninitiated viewing a game for the first time it appears to be a contest of mayhem, but upon closer observation the skills and plan of attack become apparent and the game less rugged than thought. Players and coaches invariably claim lacrosse to be a safe sport. Lloyd and Eastwood's studies, however, showed it to be a very hazardous sport, ranking fourth in accident incidence for both high schools and colleges. Since

these studies were made, however, the use of more protective equipment, particularly the face mask, and the development of playing and coaching techniques have made lacrosse a relatively safe activity.

Because of the use of crosses and the nature of the game, head and neck injuries were most common, 66 per cent of these being minor wounds. With the use of more protective equipment most injuries are probably occurring to the legs.

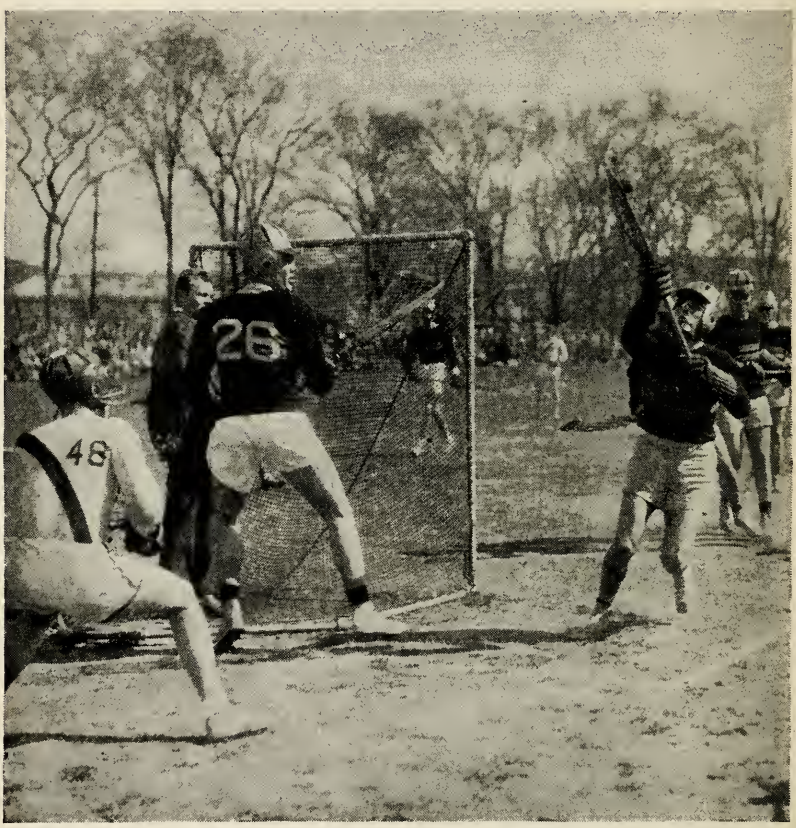
Specific Administrative Controls

All players should wear the following protective equipment: tight-fitting helmet with faceguard, shoulder pads, padded gloves, and cleated shoes. In addition, the attack players should wear arm pads and the goalie should wear a chest protector and aluminum cup. There is no school game in which the types and quantity of equipment vary to such a degree as in this game, probably because the official rules do not specify any protection. There was general agreement, however, on the desirability of the above equipment among the coaches queried by the author. Coach O'Connor pointed out that the hard-soled cleated shoe is not a safety factor in any game. Others contended that cleated shoes should not be used on dry or hard ground. Several recommended the use of armguards for *all* players, whereas others believed them necessary for defense players only. Haviland expressed the general agreement among coaches when he said: "As the game is played today, protective equipment *is* necessary. When, however, lacrosse is coached by men who know the game and who regard it as a *sport,* then few players will get hurt." There are especially constructed face masks for players who must wear glasses. The lenses, of course, should be shatterproof.

Because of the restrictions of girls' rules, protective equipment is necessary for the goalie only. Margaret Sheahan recommends that goalkeepers ". . . wear official equipment for head, face, chest, hands, feet and legs. Goal pads should be well padded and reach above the knees to protect the thighs. *Never*

play, especially in practice, without protective equipment." Phillips believes chest pads should be a part of the girls' equipment.

The crosse should be of the best material, *inspected regularly* for dangerous defects, and never used when dangerous. Because most players become attached to their sticks, it is sometimes difficult to get them to discard dangerous ones. Fitch thinks it is sometimes advisable to pad a stick for beginners in practicing checking.



Acme Photos

FIG. 57. HELMETS WITH FACE GUARDS—REDUCED INJURIES

The requirement among schools and colleges that lacrosse players wear helmets with face guards has played an important role in reducing the number of injuries.

The goal frame should be *entirely within the crease area* to avoid the danger of players tripping over or striking it. The present rules do not provide for this. The President of the United States Lacrosse Coaches' Association, Avery Blake, coach at Swarthmore, made this recommendation for safety, and the coaches polled agreed unanimously that it was desirable. Flag markers with flexible staffs should be used as a safety measure. Although it has not been shown, at least to the writer's knowledge, that the stiff-staffed flags cause injury, it is well to take the point of view in all safety provisions that the safety alternate should be used when it in no way interferes with the game. As Coach Dent points out, flag markers over five feet from the ground are not dangerous.

Additional Administrative Precautions. 1. Face masks and helmets should be inspected regularly for possible defects. 2. No coach should send a substitute into the game unless he is wearing all necessary protective equipment. 3. A good official will stop the game as soon as he can when a player for some reason has had his helmet dislodged or has dropped a glove.

Specific Leadership and Skill Controls

At the time of shoulder blocking, the head should be up, the neck "bulled," and one shoulder elevated to give added strength to the shoulders. Coach O'Connor expressed the opinion of a few others when he said: "I see no value in the shoulder or body block in lacrosse. We do not teach either." *In the body block, the ribs should be protected by an arm.* Thiel of Penn State has this to say about blocking:

> Of course, you should always protect yourself as best you can. The arm is useful for this. However, no good lacrosse player uses a body block as the term is applied in football. In a body block the blocking player is off balance if he misses, and it generally results in a sure goal. All blocking in lacrosse should be done while remaining in an upright position, so that if you miss you are in a position to recover and still stay in the play.

Repeated *practice in pivoting,* one against the other, should improve one's technique and lessen the danger of injury. As in

basketball, pivoting is one of the most useful fundamental skills. Wrenched knees and ankles can result from it when it is awkwardly done. Not only does the improvement of this skill lessen the possibility of wrenched knees and ankles but it is also one of the best techniques to use in avoiding a defensive man who is attempting a body-check. Repeated practice and study of the technique of face dodging will be necessary to avoid injury in this type of dodge, and should be used only by the more experienced players. Again Coach Thiel comments:

> I agree with this statement, but it does not go far enough. My theory is that the more skillful a player is in all departments of the game, the less chance there is for injury. The main thing is to be proficient in catching and throwing with the stick. A good stick-handler, no matter what his size, can dodge a defense man attempting to shoulder block him. All blocking in lacrosse should be done when the man does not have complete possession of the ball and thus is not in a good position to avoid the block. . . . Face dodging if properly taught and executed is the least dangerous of all types of dodges, because the offensive player moves his body as well as his stick out of the way of the approaching defensive player, and his body is facing in the direction in which he is going.

Teammates on defense should be alert to warn each other of impending pickoffs. Not only is this necessary for good defensive play but it also cuts down the possibility of players colliding, which, although illegal, is a situation in which there is a possibility of being injured.

In scooping, the butt of the stick should be kept beside (not in front of) the hip, to avoid ramming it into the groin. This is a protective measure to which all coaches call attention when instructing inexperienced players. However, in order to pick up the ball correctly the stick *must* be held in this position. Two-on-one drills in scooping should be held to emphasize teamwork and the safe methods of contact for possession of the ball. This is a drill that is much used when teaching the fundamentals of the game. However, it should be understood that it is illegal for any body contact to be made unless both players are within ten feet of the ball. Injuries rarely result from this

technique because it is generally unnecessary to make actual body contact but merely to run in front of the opponent in such a way as to slow him down until your teammate has gained possession of the ball. Practice in feinting and speed of judgment in dodging opponents in open field, combined with change of cradling, should help avoid unnecessary injury. Practice of this type is very necessary, because they are all fundamental techniques of the game of lacrosse and they must be mastered if the player expects to rise above the level of mediocrity. As a player improves in all the fundamental techniques and skills of the game, the chances of his being injured are greatly reduced. General body agility is an important factor in reducing the possibility of injury in lacrosse as it is in most team sports. This ability can be developed by practicing the fundamental skills that are part of the total game experience.

Defense players should practice timing and coordination in defense checking to avoid injuring opponents. Coach Martin says regarding this point: "I urge players on defense to carry sticks in such a position that player with ball will not hit opponent's body with his stick on follow through after throw." Defense players should be coached to check *stick with stick, and body with body.* Phillips said that the body should be used only after the stick fails to stop attack or offensive player tried to and does run through the stick. On this issue Thiel says:

> Lacrosse has relatively few injuries, but I believe more are caused by body checks and 'spills' than by clever defensive stick play. Also, there are times when a defensive man should use his body, and times when he should use his stick in playing an offensive player with the ball. The times when he should use his stick are much more numerous than when he should use his body. It is more difficult to teach a defense man to use his stick properly than it is to use his body. To me it is more important to stress proper stick work in preference to the use of the body.

In girls' play the players should be cautioned to avoid being struck by the ball when they are not in a position to catch it. "Keep your eye on the ball" is the universal slogan of all sports and applies here as well. In girls' play, because natural bound-

aries are used, extra care must be taken to avoid injury in striking trees, fences, walls, and so forth.

Additional Suggestions by Coaches. 1. In lacrosse, injuries are principally due to "spills" and colliding with opponents. To avoid this, players should be taught bodily coordination and how to fall properly. Also, if they are taught to work together as a team and not to "gang up" on the ball when it is on the ground, many of these injuries can be prevented. 2. If the game is played according to the rules and to the spirit of the rules, there is no danger of injury. Here the coach is at fault. There are coaches who do not know the game thoroughly, and there are coaches who try to beat the rules of the game. 3. Use basketball shoes on hard dry ground, especially for practice, to prevent shin splints. 4. Proper instruction and training is the best safety rule. Most injuries occur when the varsity practices against green freshmen teams or scrubs. 5. Attack men and midfielders should be carefully coached on when to cut, and how to retreat after a cut toward the goal has been made. Clumsy and thoughtless play in this department produces many injuries. 6. The best defensive players I have ever seen were the "Club" players who were too old to use their bodies effectively and always checked the opponents' sticks with sticks. Thus they were never off balance because of a missed body check, and since their sticks always had contact with the opponents' sticks, they never caused the slightest injury to anyone. 7. There should be a curb on cross-checking and rear-checking. 8. Many coaches require all players to wrap their ankles.

Tennis

Tennis by its nature is one of our safest games, since there is no player contact and playing surfaces must be smooth or the game cannot be played. Lloyd and Eastwood rate it as very low in accident incidence, 1 per 1,000 participants. Most injuries occur in the area of the leg and foot, due to the quick stopping and turning required. The surprising number of head injuries (42 per cent) are probably due to being struck by the racquet in doubles.

The Condition of the Court. It stands to reason that hard-surfaced courts are more dangerous than clay or grass courts, and most players do not need this fact pointed out to them. When the court contains sand or other impediments, extra care must be taken. Playing should be prohibited when courts are slippery after rain. The following precautions were utilized in the Badminton section but are repeated here.

Specific Controls

The game must be adjusted to the clearance provided around the court. Often the backstops are too close and trees or buildings border the court. These introduce hazards that must be met and overcome. In doubles the method of coverage should be thoroughly understood, and when there is any doubt, it is better to let the return go rather than strike one's partner. By learning a definite system of coverage and knowing what one's partner is going to do, this hazard can be largely eliminated. This danger is, of course, more prevalent when contestants are unaccustomed to each other's playing. When one's ball goes on an adjoining court, the occupants of that court should be warned and permission obtained before the ball is retrieved. A severe injury can be sustained by unknowingly stepping on a ball which has rolled into the court, and therefore careful persons warn their neighbors of this hazard.

Track and Field

Track and field events are probably the oldest athletic activities that have come down to us through the ages with a minimum of changes. Most of the events have been but slightly altered since their early Grecian beginnings in approximately 884 B.C. They reached their greatest popularity during the Olympic Games which were begun in 776 B.C. and were held every four years until about 394 A.D. These famous games were reestablished in 1898 at Athens and have been conducted since that time except for the interruption of the two World Wars. There are indications that track and field events have been popular in England since early times. Edward III

prohibited weight putting because it interfered with archery, an activity designed to fit a man for war, and Henry VIII had a penchant for the hammer throw!

A Popular School Sport. Over a million high-school boys and girls participate in this sport each year, with at least 608,000 college students and possibly a larger number of elementary-school children participating. Track and field events are quite popular in the physical education class program and form the basis for many testing programs, besides being one of the major varsity sports in most schools. As a sport they rank low in the degree of hazard, but the weight events, particularly the discus, javelin, and hammer, are considered very dangerous. In fact most schools have abandoned the use of the hammer, and many state high-school athletic associations prohibit the throwing of the javelin and discus.

Injuries. More than 80 per cent of track and field injuries occur to the leg and foot, arm and hand. Head and neck injuries are more frequent in high school, and thigh injuries in college. College women are more susceptible to injury than any other group, and the injuries are more serious.

Specific Administrative Controls

No competitor below college level should be allowed to compete in a one-day meet in more than two events, exclusive of the relay, no two of which should be the 440, 880, or mile run. The National Federation of State High School Athletic Associations has adopted a similar rule for their state meets. Among the leaders in this movement to limit the number of events for safety have been Michigan, Illinois, and New York. Usually, however, such rules do not restrict the competition in lesser meets so that coaches must exercise good judgment in limiting entries. This restriction is designed primarily as a safety and health protection measure. Some coaches feel that such hard and fast rules cannot be set because of extenuating circumstances. T. Nelson Metcalf, University of Chicago, points out that it depends on the events and the number of heats, and that "there is no justification for not counting the

relay." Coach Bresnahan of Iowa feels that a boy can compete safely in four events, such as the high jump, broad jump, shot put, and 100-yard dash. Coach Homer Allen of Purdue believes that it depends upon the competition—that sometimes a boy can run both the mile and 880 and not have to push himself unduly.

The number of competitors in a heat or final race should be governed by the safe capacity of the track. This principle is often violated, and runners are thrown to the track or pushed off into hazardous areas. Games committees or other officials charged with the responsibility for determining the number of competitors per heat should make this their number one safety rule. Lanes should be provided when short races are run around curves.

Spectators, coaches, and competitors (except when they are competing or warming-up) should be kept off the track and field during meets. This is one of the most difficult tasks in conducting a meet, but strict enforcement of this rule will not only insure safety but will also insure a better meet from both the spectators' and competitors' standpoints. During meets as many areas of the track field as possible should be roped off to prevent collisions and injuries from being struck by equipment. Many coaches and administrators feel that the benefit derived does not warrant the expense and bother of such provision, but it must be remembered that the saving of even one severe accident would justify the effort. No school is too poor to provide for the safety of its competitors. Similarly, lives should not be endangered to protect the grass on the football field! By restricting the area for the use of weight events, the events are made more hazardous.

Track shoes should not be worn in physical education track classes. The reason for this provision is that usually the school cannot provide track shoes for all participants; therefore no one should be allowed to use them. When only a few or a large number of inexperienced participants use them, there is danger of excessive spiking. Some coaches recommend that part of the class instruction be the proper care and use of track shoes.

Weight Events

Implements should be checked out and used *only under supervision* in designated and protected areas. The promiscuous use of the javelin, discus, and hammer should never be permitted. The above provision is a wise administrative safety precaution which should be followed in all schools regardless of the size of facilities. The discus and hammer should be thrown from behind a screen. This is particularly true of the hammer, but is also a desirable precaution in discus throwing. Such a screen could be placed on wheels and used in various

Scholastic Coach

FIG. 58. PROTECTION FOR THE WEIGHT EVENTS

A wire screen like this one should be provided for the discus and hammer throw.

areas just as the batting cage is in baseball. (See Fig. 58.) The implement should be rolled or carried back to the throwers. When only two men are practicing in an isolated area, this may not be necessary, but when there are more, this rule should be followed. It is difficult to put this idea across, but *it can be done*! Only officials, managers, or class safety leaders should be allowed in the area where implement is thrown. Only con-

stant vigilance will educate the other team members and students to observe this precaution.

The wire, handle, and swivel of the hammer should be *carefully inspected* before practice and before each throw. This event has been abandoned by many schools because of its danger, so that those still practicing it should take extra precautions if they wish to see it continued or revived in other schools. Similarly, the javelin should be inspected and tested for weaknesses or splinters, and even the discus should not be used when it is splintered or cracked. The use of a rubber discus is debatable from the standpoint of safety. Thirty per cent of the coaches questioned on this point by the author felt that it was not any safer than the regular discus. The author's experience indicated that the rubber discus was safer for use on the clay surface of an indoor space, because it usually bounced short instead of sliding for great distances as the wood-and-steel discus tends to do. On the other hand, most coaches believe that practicing with the rubber discus handicaps the thrower when he is required to use the official one later. *The shot should be put, not thrown.* Throwing may injure the hand, wrist, or arm. Although this precaution is covered by the rules, it is listed here because it is often overlooked by instructors in teaching the shot put to large classes. Weight throwers should acquire control by warming-up thoroughly from a standing position before using the full circle. This procedure has been an accepted custom for practice among weightmen. It is mentioned here particularly to remind coaches and officials that they should insist on the usual procedure during meets.

Added Precautions Suggested by Coaches. Metcalf thinks special precautions should be taken against the players' throwing when fatigued or when inadequately warmed up, especially throwing the javelin. Bresnahan suggests that the competitor stepping into the circle and about to throw should call "discus" loudly. This points up the exact focal point of danger. The same should be done for the other weight events. He also feels that implements should be thrown only "javelins from north" when several missiles are in use, then "javelins from

south," and so on. Jones reminds us that sector lines for the weight events should always be marked on the practice field, as well as for meets. Allen mentions that the finish yarn should be soft and weak so that it will not cut the runners.

When horse manure is encountered on the field in any great amount, special care must be taken to prevent tetanus as a result of spiking injuries. Under these circumstances it is recommended that all participants receive anti-tetanus injections before the season opens.

Precautions for Officials. 1. Before the staging of a track and field meet, it is advisable to hold a meeting of all officials in order that they may be instructed on necessary procedure, including safety controls. 2. Finish judges should be warned not to dash out into the path of other runners on the track to select their men or collect batons. 3. Officials of the weight events should be warned not to underestimate the ability of the contestants, but to remain completely out of range. 4. Judges of the turns should be admonished to call fouling as they see it. Severe injury can result from fouling when it is not controlled.

Running Events

The starting gun is a dangerous weapon. It should be used only by qualified persons. When it is necessary for track managers or class leaders to use the gun, they should be thoroughly versed in the proper and safe methods of handling and firing. It should always be fired upward and above the head. Other devices such as "board slappers" are just as effective for practice, and because they are harmless and less expensive are recommended for use by students. (See Chapter IX for precautions in gun-handling.) Starting should not be undertaken until after at least *two weeks of practice*. For many years it was traditional to practice starting right from the beginning of the season, but experience and science have taught that this calls for extreme exertion and therefore should be delayed until the runners have recovered from early season stiffness and are in fairly good shape. Some coaches believe that easy starting may be practiced safely earlier than this. *Care must be taken to*

secure the starting blocks or holes. The unexpected slipping of a block or hole may cause a pulled muscle, and runners should be taught to prepare most carefully for their starts.

To avoid arm or ankle injury, a runner should stay at least twelve inches away from the rail indoors, and at least eight inches from the pole outdoors. Often coaches teach their men to hug the rail too closely, thinking the distance is shortened, but it is questionable whether the advantage gained offsets the danger. Passing the baton is a "muscle puller" and should not be practiced too early in the season or on cold days. This is true probably because of the unnatural starting position assumed by the runner and because he often becomes cold awaiting his turn. Some coaches find it possible to use easy passing practice under these conditions. After passing the baton, the competitor should stand still or jog straight ahead, unless he is on the inside or outside of the track, in which case he should step off the track as quickly as possible. This safety precaution is a part of the official N.C.A.A. Track and Field Rules but is quoted here because many coaches and competitors are not familiar with it. Since failure to observe this rule often leads to injury, as well as to possible obstruction of another team, it is urged that all coaches and physical educators teach their participants this sportsmanlike procedure.

Runners should realize that muscles are in danger of being strained on curves. Pulled muscles are the bugaboo of most track coaches and they should leave no stone unturned to guard against this kind of accident. Certainly the competitors should be made aware of the causes and methods of avoidance. *The runner should not jump, lunge, or throw up his arms at the finish.* Some coaches feel that this practice is desirable because it makes for a faster finish, whereas others believe that it does not. However, there can be very little question about it being safer not to employ this type of finish. Metcalf believes the expert can learn to lunge forward and downward at the tape with safety. When finishing against a mat indoors, the runner should catch hold of the top with hands and turn hip into the mat. Runners often attempt to stop by placing a foot on or

running up the mat, but this practice often results in injured ankles, especially when spikes are worn. (See illustration.)

Runners' ankles should be taped for cross country running. Many coaches believe taping unnecessary except when required by the terrain or weak feet or ankles. It involves the viewpoint on whether such practice either weakens the ankles and arches or provides needed protection. Cross country runners should be taught the proper techniques of running up- and downhill to avoid injury. Runners naturally want to lean backward when going downhill, and if they relax their abdominal muscles also, there is danger of straining them when an uneven place is struck. The danger in uphill running usually lies in pulling too hard, and a pulled hamstring muscle may result.

Hurdling

"L" type hurdles should be used for team practice and meets. This hurdle is generally considered safer because it does not rise like the T-shaped hurdle when struck. Also the weight can be so adjusted as to make the hurdle easier to knock down. For physical education classes it may be advisable to furnish lighter and safer hurdles. The hurdles should be *locked at all times* during practice, because flying gates are dangerous. Most safety manuals have held that the hurdle should *not* be locked, but coaches have found it safer to keep it locked; otherwise the gate may fly around and trip the hurdler. Some coaches lock the low hurdles but not the high. The hurdle weights should be adjusted 'easily' for beginners. In other words, the hurdle should be made easy to knock down for learners. This is often a good idea for experienced hurdlers who are practicing.

A protective guard should be worn by hurdlers who hit the crossbar with ankle bone. Some coaches feel that such a device only encourages the hurdler to continue in poor form, whereas others, such as Bresnahan, believe that both heel and knee guards should be used when necessary. The guard can be made of foam rubber covered with aluminum or of leather, attachable by means of a strap around the ankle. For a knee

Mack Hughes

FIG. 59. PROPER METHOD OF FINISHING AGAINST A MAT

When finishing against a mat, the safest method is for the runner to catch hold of the top and turn his hip into it, as pictured above.

guard a lightweight basketball guard can be worn upside down, or rubber foam or felt can be taped on. The lead leg should be kept as straight as possible to prevent buckling when the hurdler hits the hurdle with the lead foot. This precaution is inserted mainly for teachers of physical education classes who are prone to neglect this important fundamental when conducting a hurdling class. Although it is generally agreed that the leg cannot be held perfectly straight, most beginners are prone to bend it too much, which usually throws the hurdler instead of the hurdle. The hurdler should never be allowed to run through the hurdles in a lackadaisical manner or show off by clipping them too close. These two common mistakes take a heavy toll in injuries, particularly among high-school hurdlers, and every coach is warned to prevent his men from engaging in such foolhardy tactics. Some coaches never allow their

hurdlers to take more than the regulation number of steps between the hurdles, which helps prevent the above faults.

Mass hurdling (one hurdler on the heels of another) should *not* be permitted in physical education classes. When one runner follows the other too closely, a fallen hurdler may cause others to be injured, or the misplaced hurdle may trip succeeding runners. Furthermore, it is poor teaching technique.

FIG. 60. ANKLE PROTECTOR FOR A HURDLER

A protective device for the ankle bone can be made of rubber foam and aluminum or leather in this shape and attached by straps or tape.

Jumping Events

Adequate mats or pits in field houses, carefully arranged, should be provided for landing on indoor floors. A double deck of overlapping mats, extending at least four feet outside the standards and over five feet to the rear, is recommended. Special cutout mats are also recommended to cover the bases of the standard. For high jumping and pole vaulting, jumping pits should be of sufficient area, composed of shavings and built up; for broad and hop-step jumping, they should be composed of sand only and flush with the ground. In high schools 67 per cent of the field-event injuries were found by Lloyd and Eastwood to be due to improper landing in jumping pits, either because of lack of skill or because of improperly constructed landing pits. The minimum dimensions established by the rules are considered too small. The high-jumping pit should be at

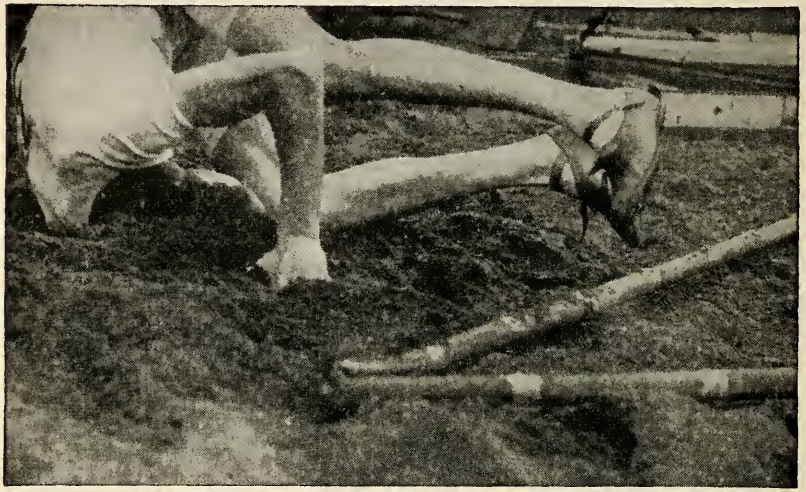
least eighteen by fourteen feet; the vaulting pit at least eighteen by eighteen feet; the broad-jumping pit, six feet wide and at least sixteen feet long, with the board approximately eight feet from the pit for high schools and twelve feet for colleges. Standards should be sufficiently weighted to prevent toppling, and crossbars should be free from splinters. A new type of vaulting standard, with the base set permanently in cement and adjustable forward and backward with a crank, is recommended for safety. The base of the standard should be covered by bags of shavings.

Contestants in physical education classes should be required to stop when it is obvious that they have reached their maximum height or distance. This precaution will save many painful injuries, and instructors should enforce the rule strictly in spite of protests from the determined competitors. *The old-fashioned scissors jump is very dangerous and should not be allowed.* In this style of jump the man lands backward and often injures his hand or arm when it is pinned beneath his body. This is particularly true when the jumper reaches his maximum height. If the scissors jump is permitted, the preceding and following precautions should be strictly enforced.

Physical education class participants in the high jump should be required to land on their feet only, to prevent injury to the hands, wrists, or arms. Although a number of the coaches polled disagreed with this precaution, it is listed here because of the experience of the writer, who found a remarkable decrease in hand, wrist, and arm injuries after enforcing this rule for indoor jumping on mats. Coach Allen expressed the opinion of others who believe that this precaution keeps the participants from learning correct form. Bresnahan says: "We instruct high jumpers to relax when alighting in the high jump, similar to telling a boxer to 'roll with the punch.' The arm is used effectively to break the fall in such forms as the 'Western' or in its variation the 'Western Straddle.' "

The take-off board in the broad jump should be level, and the surrounding ground flush with the board. Although this provision is in the rules, it is reiterated here especially for the

instructors of physical education who may become careless because of the large numbers using the facility. All jumpers, except those in physical education classes, should wear shoes with heels, or spikes, or rubber cushions. The only reason for excluding physical education class members is that neither they nor the school can afford to provide such shoes. Even if they could be provided, it is doubtful that it would be wise to do so, because many participants could not learn to use such spikes safely. A few good high jumpers may not require such a shoe.



Scholastic Coach

FIG. 61. A BAD BREAK!

This dramatic picture was taken of a vaulter whose pole had broken. Vaulting poles must be carefully selected and maintained if such accidents are to be avoided. Aluminum poles are safer than bamboo and last longer. Note how the bamboo pole broke.

Aluminum vaulting poles are safer than bamboo and should be used at all times. Although many of the topnotch performers prefer the springier bamboo, when it is a question of safety, there can be little doubt that the aluminum poles are superior. They are especially safe and usable in intramural and class meets. Vaulting poles should be tested for weight-bearing strength before the beginning of the season, and pe-

riodically thereafter. It is recommended that a homemade testing device be rigged up to test all vaulting poles. By anchoring both ends of the pole and pulling at the center with a spring-hook scale, the weight-bearing strength can be determined. Dried-out poles should be discarded. Pole vaulters should use poles which have a safety-strength margin of at least ten pounds. Most sporting goods companies designate the weight-bearing strength on each pole. If a pole is not so marked, it is recommended that it be tested and painted or burned with the safe weight-bearing amount. This problem is worthy of more advanced study. Injuries caused by hitting the pole on the way up can be prevented by taking off properly. They may be caused by taking off with left foot too far to the left, or vice versa. Other causes are incorrect method of pole placement and improper grip, pull, or swing. The injury incurred by hitting the pole with the leg is not usually very serious, but such a mistake may lead to the more serious accident of throwing the vaulter into the standards or twisting his back.

Additional Suggestions by Coaches. Woodruff recommends a double broad-jump board with air space between, which tends to prevent bruising of heels. Bresnahan comments that many vaulters are injured by landing on the displaced crossbar and that numerous bystanders have been injured by a forcefully tossed pole. Alert pole catchers can usually avert the latter danger. He says also: "We at the University of Iowa are working on a resilient, yet surefooted type of footing for the approach runways in the vault and jumps, and hope to have data by the spring of 1947. We believe this will reduce heel bruises, provide all-weather takeoff, and alleviate muscle injury due to slipping at the instant of takeoff. Thus far it is successful for the high jump." Metcalf suggests, as a precaution against fatigue, that the number of meets be limited to two per week. Nay recommends "not too much running under the watch until there is sufficient practice to insure condition. Limit distance for immature runners." Eaton suggests that because shuttle-hurdle relays are so hazardous, they be run on the grass.

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XIII

SAFETY IN SUMMER SPORTS

Not Under School Jurisdiction. FEW ADMINISTRATORS have considered the sponsoring of summer camps and playgrounds as the responsibility of the school system. Some fail even to see the value of outdoor education. The trend is in this direction, however, and educators more and more are realizing the values to be derived from such training. L. B. Sharp, Director of Life Camp, Inc., writes:

> The school camp is a part of the total outdoor education program. It is as important a part of the school plant as classrooms, libraries, shops, laboratories, and athletic fields. If the camp program is educationally sound, children of the community are entitled to its offerings on the same free basis as that of the rest of the school program. Public schools are supported by taxation, and, therefore, as a part of the school plant, the school camp should derive its chief support from tax funds. Teachers are almost entirely prepared for instruction purposes in the school buildings. It is right that they should be trained also for carrying on the education program in the school camp.[1]

More schools, especially the larger systems, do sponsor summer playgrounds. Playgrounds have long been regarded as harbors of safety for the children of the community, a place where they can play out of the reach of traffic and back-alley dangers. Fishing, enjoyed by more people than any other sport, presents many of the hazards of such sports as camping, hunting, swimming, and hiking. The following summer-activity safety controls are offered to help prepare teachers for service in these fields.

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[1] "Basic Planning for Camping and Outdoor Education," *The American School and University,* 1946 Yearbook. New York: American School Pub. Corp., p. 192.

Camping

Each year hundreds of thousands of persons return to nature through camping experiences. Many of these campers are totally inexperienced and inadequately equipped to experience the benefits of outdoor life without exposing themselves to a large number of unnecessary hazards. Most accidents are the result of unqualified persons attempting camp adventures beyond their ability and knowledge. *Inexperienced campers should either join an organized camping group or be accompanied* by a person or persons qualified to cope with the type of country and activities to be engaged in. The American Camping Association recommends that one experienced adult accompany every four child campers during "unorganized" outings, and that eight should be the maximum safe number for one to sponsor in organized camping.

Organized Camping. More and more educators are realizing the benefits to be derived by young people from camping. Many schools now sponsor summer camps, and there is evidence that this movement will experience a greater growth in the postwar period.

J. Edward Sanders,[2] who made a most extensive study of health and safety in camping, lists the following trends as affecting the camp safety problem: *First,* the age of admittance for campers is becoming younger, some camps admitting six-year-old children. *Second,* camping has become "big business," with a few persons operating camps for profit who are not fitted to conduct such an enterprise. *Third,* that certain camps have increased so in size that they have become small villages, with the accompanying problems of safeguarding many persons. And *last,* camping has become a factor of public health and safety in which the state is gradually assuming control.

Although there is no accurate method of comparing the accident incidence of camping with home or summer vacation

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[2] *Safety and Health in Organized Camps.* New York: National Conservation Bureau, 1931, pp. 2–3.

records, it would be expected that youngsters coming into an entirely strange environment would be prone to experience an unusual number of accidents unless a thorough educational and preventive program were conducted.

Injuries and Their Causes. It may be expected that about two thirds of the injuries occur to the skin, the remaining third consisting of muscle injuries, bruises, strains, sprains, and bone injuries. Falls account for 32 per cent of the accidents among boys and 28 per cent among girls, and 20 per cent of the boys' accidents and 31 per cent of the girls' occur when they are walking or running around the paths of the camp.

Accidents Can Be Prevented. Sanders concluded that 25 per cent of the accidents could have been prevented if the sites had been well selected and the camps well equipped and cared for; that 26 per cent probably could have been eliminated by disposing of the poison ivy and insects; and that by proper education and supervision in the use of axes and knives, in horseback riding, and in wearing proper footwear, another 14 per cent might have been prevented. "Of the remaining 35 per cent of accidents in the camps studied, only 11 per cent seem, for practical purposes, not to have been preventable. The other 24 per cent could have been prevented only by the exercise of greater care and intelligence on the part of the injured individuals, though over half of that number might have been prevented by adequate supervision." [3]

Attitude Toward Safety. F. C. Mills, Director of Health and Safety, Boy Scouts of America, expressed most lucidly the attitude which the writer hopes will be conveyed by this material. He said:

> It is possible to surround camping and aquatic activities with negative rules that take all the fun out of being a camper or swimmer. The philosophy of our organization is safety through skill. Overprotection, paradoxically, can cause many accidents. We believe in teaching skills which will make it possible for boys to learn to meet life's situations. I know of camps where children are robbed of their self reliance by the over-protective policies of the management.

[3] *Safety and Health in Organized Camps,* p. 45.

Example is one of the greatest forces in the teaching of camp safety. Every camp leader is urged to set a good example by acting safely under all circumstances. He should also provide an inconspicuous and unobtrusive type of safety supervision which is motivated by a genuine interest in the welfare and safety of the boys and girls.

Specific Administrative Controls

A meeting of the counselor staff should be held before or at the opening of the camp to discuss and lay plans for safety and sanitation and for a complete inspection and correction of possible hazards. Herbert J. Stack in addressing such a meeting said, "I do not need to call to your attention the fact that a serious accident, such as a broken leg or collarbone, may rob a camper of many weeks of happiness and adventure. A fatality —and fatal accidents are exceedingly rare—may ruin our camp." He continued by outlining the methods of attacking the problem:

> As I have repeatedly stressed, as counselors directing camp activities you have a major responsibility to reduce accidents to a minimum. You can do this in four primary ways: first, by planning activities that are reasonably safe; second, by removing hazards wherever possible; third, by proper supervision of the activity; and fourth, by teaching campers and counselors safe practices in these activities. These are parallel, in a way, to the three E's in Safety: Education, Engineering, and Enforcement.[4]

The hazards of a camp that should be removed, repaired, or compensated for include such items as glass, tin, nails, wire, unsafe flooring, steps, and ladders, uneven and rocky paths; poisonous plants, and so on. There can be little doubt concerning the advisability of removing dangerous debris and repairing flooring, steps, and such, but the desirability or possibility of making all paths foolproof is questionable. An effort should be made to eliminate a certain amount of uneven or slippery surfaces and hazardous inclines, but complete security is often im-

[4] "Setting the Stage for Safety," *Camping Magazine,* March, 1939.

possible. A Boy Scout official cited a case where a girl sprained her arm falling on a rock in a girls' camp. The camp director the following year, at great expense, had as many of the stones removed as possible before the opening of camp, only to have three campers experience broken bones from the same source!

Sufficient bulletin boards with safety rules and regulations should be provided at strategic locations about the camp area. One of the principal faults in using the bulletin board or poster technique is that it often becomes the *only* teaching device. A good joke will often make a point better than a serious article. The director of each camping activity should be responsible for the safe conduct of that activity, and the cabin counselor should be responsible for his cabin. The designation of persons responsible for certain areas of the camp or phases of the program is a wise and necessary administrative task. (See Chapter VII.)

The health examination and parents' statements should inform the administrative staff of each individual's handicaps and idiosyncracies, such as epilepsy and sleepwalking, which might endanger the camper's existence. These individual traits are often difficult to ascertain, but it would be well worth the effort expended if the counselors could be forewarned and instructed in the accepted best methods of handling. Campers should be given special health examinations before embarking on prolonged canoeing, hiking, and camping trips. It is assumed, of course, that all campers will have been thoroughly examined before coming, or upon entrance to the camp, and as often thereafter as may be deemed necessary, further examination will be made by the physician. To take a camper who is not capable of withstanding the hardship on a trip is not only an injustice to him but to his companions as well.

If it is necessary for the staff to use gasoline or other inflammable materials, they should be safely stored and not used by the campers. These inflammable materials should be stored in a fireproof, vented storage place, and the key should be kept in the possession of one person only who should be responsible for all issuances and for the uses to which the materials are put.

Camp buses should be driven only by qualified adult drivers, and campers should not use, or be driven in, camp cars unless public liability insurance is carried. State laws vary. Each camp must work out its own method of controlling this issue, which in many localities is a serious problem. Campers should not be allowed to possess firearms or to use them except under expert supervision. Possession or use of firecrackers or other explosives should be prohibited. This rule should be thoroughly understood by all before coming to camp, then careful precautions taken to make certain that none of the campers possess weapons. The archery butts and rifle ranges should be located at the edge of the camp in the safest possible area.

Specific Leadership and Skill Controls

Campers should be instructed to drink and eat only the water and food approved by the camp staff. Although this precaution is primarily one of hygiene or sanitation, it is listed here because of its significance. The campers should be so well instructed with regard to this item that violation of the rule would be an accident! Campers should be informed on the recognition of, and methods of avoiding, dangerous animals, insects, poisonous plants and snakes indigenous to the area. They should also be instructed in proper first-aid treatment. These two areas of instruction are normally an accepted portion of every camp program, and when they are presented in a positive, constructive manner, they should do much to reduce the hazards. As Sanders points out, 25 per cent of camp accidents could be eliminated thereby. (See Chapter V for school first-aid procedures.) Campers should be instructed on the safe use of axes, knives, and other common camp tools. Those taking arts and crafts should receive special instruction in the safe use of such tools, machinery, and materials. The need for such instruction is so obvious that it is difficult to conceive of any responsible camp that would fail to provide it. "Practice of these skills does not have to be either boring or monotonous. Campers readily understand how essential it is for each one to

The Joy Camps
Hughes Photos

FIG. 62. LEARNING TO USE DANGEROUS TOOLS SAFELY

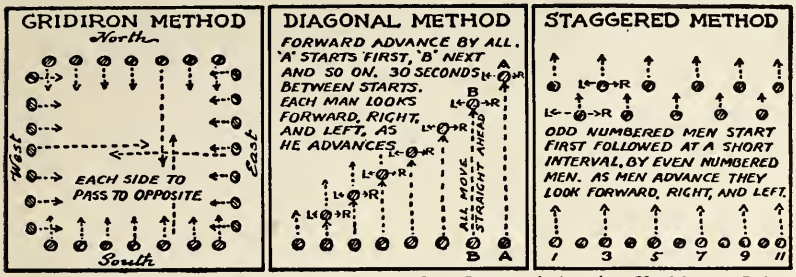
These girl campers are being taught the proper methods of using one of camping's most hazardous tools, the knife. When it is properly taught, safety instruction is not boring.

be able to take his part." [5] Campers should be instructed and trained in the safe methods of building and controlling camp fires used for cooking and heating. Arthur H. Desgrey, City College of New York, says: "A large percentage of camp accidents may also be traced to a lack of knowledge and information, and to the absence of safety skills necessary for camping." For this reason the last three items have been listed.

When it is necessary to travel on a highway, campers should

[5] Barbara Ellen Joy, "Overnight Trips—Yes and No!" *Journal of Health and Physical Education,* April, 1938, p. 362.

be taught to walk on the extreme left, and to wear something white and carry a flashlight at night.


GRIDIRON METHOD
North
West
East
South
EACH SIDE TO PASS TO OPPOSITE
DIAGONAL METHOD
FORWARD ADVANCE BY ALL. 'A' STARTS FIRST, 'B' NEXT AND SO ON. 30 SECONDS BETWEEN STARTS. EACH MAN LOOKS FORWARD, RIGHT, AND LEFT, AS HE ADVANCES.
ALL MOVE STRAIGHT AHEAD
STAGGERED METHOD
ODD NUMBERED MEN START FIRST FOLLOWED AT A SHORT INTERVAL, BY EVEN NUMBERED MEN. AS MEN ADVANCE THEY LOOK FORWARD, RIGHT, AND LEFT.

Boy Scouts of America, Health and Safety

FIG. 63. HOW TO SEARCH FOR THE LOST*

These three methods of combing the countryside for a lost person are advocated by the Boy Scouts of America.

Hiking Safely. One nationally known camp leader summarizes overnight camping in this manner:

Safety anywhere, in this day and age, is a matter of training, good sense, and good judgment. Safety on trips is assured only by mastery of camping-out and enabling skills, and by knowledge of the hazards inherent in the environment. It may be rapids in the river, poison ivy or snakes on land, squalls on the lake, slippery rocks on the mountain, or a horse which shies too suddenly on the trail. The main thing is to be cognizant of the hazards that may be met with in each situation, and then be prepared to meet them. In addition we should not take chances or become overfatigued. We should keep all equipment in good repair, keep the group together, and keep the morale high. We must know the country we are going through, be prepared for all emergencies, and keep steady when one occurs.[6]

Hikes should be thoroughly planned, with one counselor in charge and others of the staff assisting as the size of the party may require. If there is to be swimming, at least one of the coun-

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* Reprinted by permission of the Boy Scouts of America from the October, 1946 issue of their Health and Safety Magazine.

[6] Joy, "Overnight Trips—Yes or No!" p. 362.

selors should be a water sports specialist. The number of counselors necessary will vary with the age of the group being conducted, but in general the proportion ranges from six to twelve hikers per counselor. For overnight hikes, the camp site should be selected for its safe location, nearness to drinking water, shelter, and accessibility to a telephone. The last item, accessibility to a telephone, may not be possible, but anyone who has experienced the necessity of taking care of a seriously injured or ill camper under such circumstances will appreciate the importance of this precaution.

Sufficient first-aid equipment should be on hand, including gauze, iodine or other antiseptic, bandage, bandaid, adhesive tape, torniquet, aromatic spirits of ammonia, scissors, scalpel, safety pins, ointment for poison ivy and burns, and snake bite remedy if necessary. Other remedies may be deemed necessary for particular sections of the country, but these form the basic items for most kits. Halazone tablets might well be considered an essential of the first-aid kit.

On an overnight trip the hiker's equipment should include strong, well broken-in shoes, knife or ax, blankets, flashlight, compass, canteen, and sufficient clothing for climatic conditions. The counselors will carry the necessary maps and matches. For daytime hikes the blankets and flashlights may be omitted. The party should travel with one counselor in the lead and another bringing up the rear. *Roll calls* should be made at necessary intervals. By using the buddy system, which is recommended, roll calls will not be necessary so often. A hiker should stay with the party and protect the fellow behind by holding branches and warning of holes and other dangers; he should not be allowed to show off by doing dangerous stunts. Few activities promote the feeling of comradeship more than hiking does, and these acts of sportsmanship are spontaneous with most persons. There should be a prearranged *plan of operation* for group and individual conduct in case someone becomes lost. There are several different methods of procedure, but probably the best is to require the lost person or group to "sit tight" and await rescue. During this time the

person or persons should conserve energy and food, seek or build shelter, and light two signal smoke fires.[7] The use of other types of signals could also be prearranged. Another plan would be to instruct lost hikers to seek to return to camp, provided some convenient stream, lake, or other landmark exists which would make such a return comparatively certain. Or, if the destination of the hike is some mountain peak or large lake, it might be advisable to arrange for the parties to meet there.

It might be desirable to combine these ideas and say something like this: "If you become detached from the party, seek to reach the destination by the use of your maps and compass until nightfall. If you are not successful, prepare to 'hole up' and await rescue, observing all of the woodcraft and rescue precautions you have learned." The accompanying illustration shows the various methods of combing the countryside for lost persons. *Instruction in methods of survival should be a part of every camper's training.* Space does not permit the elaboration of these techniques, but there are many fine sources of information available to camp leaders.

Fire Prevention. The threat of fire hangs heavily over the camp director's head, because most buildings are highly inflammable, and the fire-fighting equipment of necessity is limited. Rigid rules governing the use of matches and smoking must be enforced. The kitchen should be most carefully planned to control the fire in that area. Camp fires must be built in accordance with accepted safe practices and only under supervision. *Fire drills should be thoroughly organized and periodically practiced.* In those areas where there is danger of forest fires, plans for reporting and defending the camp against them must be established and practiced.

Aquatic Safety. "In the light of the small incidence of swimming accidents in high schools and colleges, it is unexpected to find such a large number of swimming accidents occurring in summer camps. . . . This means that the camp rate per 1,000 of 16 is 30 times that of the high school students and

[7] Two columns of smoke are recognized all over the world as a distress signal.

college men, and approximately 24 times greater than that of the college women's rate."[8] When one considers, however, that the outdoor swimming area of most camps is much more hazardous than the comparatively safe indoor pools of schools, this disparity is not so surprising. Because of this and the fact that the campers are usually a less homogeneous group, waterfront directors must organize and administer the program in a most efficient manner. The following safety controls are recommended with this in mind.

Specific Administrative Controls

Dock, flats, ladders, diving platforms, and boards should be inspected often for weak spots, splinters, and nails, and should be kept in repair. Frederick W. Luehring, Professor of Physical Education at the University of Pennsylvania, recommends that this inspection be made *daily* by the instructor in charge. Regardless of how often it is made, much depends upon the thoroughness of the inspection and certainty of the correction of defects. *Roped-off areas and/or cribs should be provided at proper depths for each classification of swimmers.* Although some camps may not be able to afford cribs, all should be able to provide the ropes and floats necessary to control the nonswimmers' area. The ideal arrangement provides crib areas for beginners three and one-half feet in depth; for intermediates, seven feet deep; and for advanced swimmers and diving, at least twelve feet deep. At the beginning of the season hazardous rocks, stumps, logs, glass, wire, cans, and so on, should be removed from the shore, from the bottom of the swimming area, and from the sink holes, and various depths should be charted. The hazards of the swimming-area bottom can be determined by the use of group surface diving and sounding. Water boxes and face glasses are helpful for this method of survey. Similar inspections may be needed if unusual weather is experienced. *Safety equipment* that should be provided should include dory skiffs, bamboo poles, grappling irons,

[8] Lloyd, Deaver, and Eastwood, *Safety in Athletics*, p. 123.

water scope, life rings, signal bell, buddy board and tags, combination reel line and surf buoy for swimming rescues. The number and variety of these items that may be needed will be determined by the facilities and number of swimmers. These various devices must be carefully maintained and strategically located if they are to be of most value.

On hikes swimming places should be approved by the aquatic director, and plans for safeguarding the swimmers determined. This provision would include such precautions as checking the water for sanitary conditions, depth, current, and temperature; the condition of the bottom and of the beach; and the presence of poisonous plants.

A check board, for checking swimmers in and out of the dock area, should be provided. This system is particularly valuable for use during recreation periods. Unless it is efficiently managed, such a system loses its value. Because of its importance great care must be taken to operate it efficiently. No one should be allowed to enter the water unless *supervised* by a counselor or lifeguard. This provision is almost universal in aquatics and may necessitate constant supervision of the waterfront. Swimming classes should not be scheduled for the first hour following meals. It is recognized that some research has discredited the theory that stomach cramps are caused by swimming too soon after meals, but since this period is not too profitable for instruction, the above precaution will work no hardship and may be a possible safeguard. (See page 295.)

It is advisable to require swimmers on the various levels—beginners, intermediates and advanced—to wear different colored swim caps. This is common practice in girls' programs, because they usually prefer to wear caps, but most boys object to wearing them. Some administrators require only the nonswimmers to wear them or to utilize some other mark of distinction. *Each lifeboat should have a crew of two,* one to man the oars and the other to rescue swimmers who get into trouble. The conditions and number of swimmers that make a boat patrol necessary vary, but the minimum number of swimmers is usually considered to be about fifteen. Bathers

should be required to wear shoes to and from the beach. Many camp accidents occur on the paths, and going barefoot would certainly add to the casualties.

Center for Safety Education, New York University

FIG. 64. TWO TO A LIFEGUARD BOAT

It is advisable to have two lifeguards man a lifeboat, one to row, one to rescue.

Special Leadership and Skill Controls

A lifeguard crew, consisting of Red Cross [9] lifesavers among counselors and older campers (at least one for every ten swimmers) should be organized, trained, and on duty when necessary. With older or more advanced groups it is, of course, not necessary to provide this ratio, but it is easily recognized that if any error in the number of lifeguards allocated is to be made, it should be on the side of too many rather than too few. They should be assigned and properly placed so that they can supervise a definite area and observe every swimmer at all times. *Direct waterfront safety instruction and training,* including water accident prevention, self-rescue, and lifesaving should be given all campers. Most camps maintain a regular system of instruction, including awards for attaining the various levels of efficiency. Such agencies as the Red Cross and Boy Scouts are

[9] Throughout this material the American Red Cross system is referred to because it is the most common. The author also approves of the many other recognized systems advocated by such organizations as the YMCA, and Boy Scouts of America.

usually available to assist in these programs. The aquatic instruction program should begin with testing to determine the abilities of all campers, then assignment should be made to the various classes for which they qualify. It is not necessary to list the various tests available, because most aquatic directors are familiar with them.

Boy Scouts of America
Wallace D. MacBride

FIG. 65. THE BUDDY SYSTEM

The Buddy system, originated in 1921 by Colonel George Holden at Camp Devons, Mass., is one of the finest water-safety methods ever developed. Captain Fred C. Mills, then with the American Red Cross, was present at the time, and the system seemed so sound that he related the idea to headquarters. The Buddy system, then called the Holden Plan, has become a universal waterfront favorite.

The buddy system should be in force at all times, and whistle checks made about every ten minutes. Conditions may require more or less frequent checks, which should be determined by the director. The last check-up should come immedi-

ately following the "all out" signal, when the swimmers should immediately leave the water and file by the check board for a final checkout.

Long-distance swims should be taken *only by permission,* and each swimmer should be accompanied by one boat and a competent oarsman. It would be safer still to have two qualified persons in the boat to accompany the swimmer. By conducting a sufficient number of such swims, the swimmers' desire for testing their strength will be satisfied, and they will not be tempted to try them "on their own." No roughhousing, pushing others overboard, ducking of weaker swimmers, and so on, should be tolerated. This provision naturally can be carried too far so that free swim periods are robbed of much of their fun, but as a general rule it must govern the conduct of all beaches. Good swimmers should not be permitted to play jokes on unsuspecting poor swimmers. Taking dares and challenging others to perform foolish stunts is another method of inviting trouble. The poorest and most dangerous joke anyone can play when swimming is to call for help unnecessarily. *Swimmers should be cautioned never to dive into strange water.* Divers should always be certain of the depth and conditions at the bottom before diving. A good rule is to dive only in regularly designated diving areas. *The diver should wait until the preceding diver returns before diving, and he should be careful to avoid other swimmers.* In addition, divers should test the board or takeoff, await their turn, and not try to show off.

When a swimmer begins to drown or gets into trouble, the lifeguard should follow the Red Cross's recommended procedure. For going to the aid of others, the American Red Cross warns us, "swimming is the last method to be used in rescue work, not the first, and it is only to be resorted to when other means are not practicable." In cases of suspected drowning, *artificial respiration* must be begun at once and continued until the victim is revived or a physician orders it stopped. The early moments following such an accident are the most important and rescuers should keep this fact constantly in mind.

Beginners should not be allowed to go beyond their depth,

even with artificial support. Many administrators prohibit the use of such supports, but if they are permitted, this rule should not be violated. Stack and others list six very dangerous swimming practices even for experts:

1. Swimming too far out and in dangerous currents. 2. Swimming to rescue others when boats, buoys, and other aids are available. 3. Diving into water without knowing whether it is deep enough or whether there are other possible dangers. 4. Staying in the water too long. 5. Swimming after dark. 6. Swimming under docks, piers, or rafts.[10]

Boating and Canoeing. "Every boy in camp should learn to row, whether he can swim or not. Swimming can be learned by most boys back home. Rowing, which can be very important, is hard to learn, because little instruction is given except in camps." Fred Mills, Director of Health and Safety for the Boy Scouts, made this comment. It is assumed that all boat counselors will make certain that their craft are seaworthy and that the oars and paddles are in first-class condition. All rowboats should be equipped with rowlocks that permit the oars to be feathered. The pin type of rowlock is condemned.

Boating and canoeing should be permitted only at scheduled times, when lifeguard crew is on duty, and in accordance with tests passed. Some authorities do not agree with Captain Mills' statement above, but believe that no one should be permitted in such craft unless they are able to take care of themselves in the water. Goddard DuBois, Director of Camp Caribou, recommends a tag-checking system for boating the same as for swimming, and the hoisting of a flag to designate the times boating and swimming are permitted. Only qualified swimmers should be permitted free boating periods, within special limits and time regulations. No camper should be permitted to go out alone, either in a boat or canoe, until he has demonstrated ability to take care of himself and his craft in an emergency. Regardless of craft, weather and water surface conditions are

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[10] Stack, Seaton, and Hyde, *Safety in the World of Today*, p. 250.

important safety factors. One should not leave the shore if a storm is threatening.

Canoes should be provided with thwarts so that canoeist will be required to sit or kneel on the bottom while paddling. This places the center of gravity lower in the canoe and makes it less likely to tip over. *Life preservers should be aboard all boats and canoes,* especially those used by novice boatsmen and camp visitors. This precaution is particularly applicable to those camps in which nonswimmers are permitted to use boats and visitors are allowed to use such craft or accompany camp members. Inexperienced canoeists and boaters should change seats only when the boat is docked. Even experienced canoeists are cautioned against this dangerous maneuver, and inexperienced persons should go ashore to change seats. A canoeist should not stand up or lean out to retrieve something. The temptation to lean out to retrieve a dropped oar is great but it may lead to a tipover.

Canoe trips should be limited to campers who have passed qualifying tests. A senior Red Cross lifesaver for approximately every ten canoeists should be along on the trip, with a senior counselor in the first canoe and an assistant in the last. By qualifying tests is meant tests of endurance and knowledge as well as of skill. There are many dangers on a trip of this sort and all of them cannot be pointed out, but a common mistake is to hitch all canoes together and then tow with a motor launch. If a severe storm were to arise, this alignment could become quite dangerous. Campers should not be allowed to wear heavy boots or rubber boots in canoes or boats. The amount of boats and equipment would be governed by the number on the trip and its length. A tin can or other vessel to be used for bailing may be useful. Canoe and boat capacities should be determined by the director of aquatics, and the limitations should be strictly enforced. The rowboats should have their capacity painted on them. This may be determined by the following formula: Multiply the length by the breadth by the depth by 0.6 and divide by 7.

Beginners should work in calm water, close to the shore.

It is customary to designate definite areas for the use of beginners and accomplished canoeists.

American Red Cross

FIG. 66. REMAIN WITH THE BOAT

One should always stay with an upset craft unless it is being borne into a dangerous situation. Many thousands of lives could have been saved if this precaution had always been followed.

Visitors should be allowed in craft only upon approval of aquatic director. It should never be taken for granted that passengers can swim or handle the craft. This precaution was suggested by a camp director who experienced a very serious mishap because two visitors, who claimed to be competent swimmers, were allowed to go canoeing with one of the campers. *Campers should be instructed to remain with the canoe or boat if it upsets.* A lack of knowledge of and obedience to this basic boating safety factor has probably cost more lives than any other. Every such craft is so buoyant that it will support the occupants when turned right side up, and the occupants should

never try to make shore unless the craft is being borne by wind or current into a dangerous situation and the unfortunate ones are positive of their ability to reach safety. The weak swimmer or swimmers can be placed in the craft, and the strong can tow them ashore by grasping the gunwhales.

Luehring reminds us that canoeists who cannot "right" an overturned canoe should not be permitted to use one alone or in rough weather. Mills warns against holding hands across the bottom of an overturned craft, because it is a position that is very tiresome and cannot be held for long; he thinks all canoes and most boats can be turned right side up.

With the exception of the lifeboats, no boats or canoes should be allowed near the swimming area. The boating counselor should not only designate the various boating areas, but should use a water patrol to supervise, issue summonses, and so on. Likewise fishing areas must be reserved so that casting will not be a hazard to either boaters or swimmers.

Additional Suggestions. Lloyd and Eastwood say:

> It is highly desirable that more emphasis be placed on the proper handling of canoes and rowboats, rather than having swimming tests as the only prerequisite. To date little attention has been paid to adequate instruction in the handling of boats and canoes, and too much emphasis placed on jumping out of the canoe and swimming for fifteen minutes, and rules of a similar nature.[11]

There should be separate docks for boating, so that they do not interfere with the swimming areas. The usual safety precautions governing construction hazards and proper use of docks should be observed. The use of aluminum canoes should probably be delayed until their safety has been determined. Steel boats are not recommended.

Fishing

More people engage in fishing than any other sport. Menke claims that there are about 13 million fishermen in the United States, only about 8 million of whom are licensed. He

[11] *Safety in Athletics*, p. 132.

estimates that these fisherfolk spend at least one billion two hundred million dollars every twelve months on the sport, which also places it at the top of the list for the amount of money spent on sports in America. There are no studies available showing the number of persons injured each year in angling activities. Even statistics as to the number drowned while fishing are not available. It may be assumed, however, that the accident incidence is rather high because of the unlimited number of outdoor hazards to which the enthusiastic Izaak Waltons are subjected. Among these are the bites and stings of animals and insects, poisoning by plants and reptiles, cuts and lacerations from fishing and camping gear, falls from high places or rough terrain, overexertion, burns from the sun, camp fires, and gasoline engines, the dangers accompanying the use of alcohol, and, last but not least, the many water and weather hazards.

Fish Hook Dangerous. The fish hook is a very dangerous implement and many have suffered from being caught on it. Because of the hook's unsanitary condition it is considered a very infectious thing. There are several fish that are dangerous, among them the sting ray, electric eel, Portuguese man-of-war, the bull-head or mud-cat, and such predatory fish as the barracuda and shark. Although most of these fish are never fished for, they present a potential danger to those in or near the water. A salt-water fisherman should be wary of any odd-looking fish he catches with which he is not familiar.

Not Taught in Schools. Despite the fact that more persons engage in fishing for recreation than in any other sport, schools in general do not include instruction in the methods of angling or impart a knowledge of the hazards. A small number do include bait- and fly-casting in the physical education program. It is recommended that all schools at least teach the hazards attendant on this sport and the safe methods of its conduct.

Skill Controls

The reader is referred to the accompanying material on camping safety because many of those safety precautions are

helpful and necessary to fishermen. Probably the first and most important of these precautions is that *the fisherman should never go out on the water in any small craft unless he can "take care of himself" in the water.* For those who cannot swim this would include the ability to stay afloat and maneuver in the water with a life preserver jacket. Under no condition should two nonswimmers go out together, or with a third who can swim, in a small boat. It is usually unwise for any person, regardless of skill in the water, to set out on a lone fishing expedition in a boat. This precaution, of course, would not apply to fishing on small ponds or streams but to more treacherous areas. It is usually safer to have another person available in case of trouble.

The beginner should master the fundamental skills of bait- or fly-casting before fishing in this manner. Not only is the beginner dangerous to others but to himself. This is especially true when the novice attempts casting from a boat. When he is fishing from a boat, the angler should observe general safety precautions of handling a boat. These fundamentals are explained in the section on Camping. The wearing of boots in a boat is particularly dangerous and only the foolhardy will do it. A nonswimmer should wear a life preserver when fishing from small craft.

First Aid to the Fisherman. The common but dangerous and painful injury of being caught on a fish hook usually presents a very serious first-aid problem. Although the victim is often many miles from medical aid, it is advisable in most instances to allow only a physician to remove the hook. When such professional assistance is not possible, the hook may have to be removed by cutting off the barb or eye and then pushing it on through. If possible, the remaining end should be sterilized before being pushed through. Needless to say, this is a dangerous process which calls for the thorough cleansing of the wound following removal of the hook. The wise fisherman will carry the necessary first-aid equipment on all trips where such supplies are not immediately available. In addition to the usual gauze, tape, and antiseptics, a good pair of strong,

sharp-nosed pliers should be carried to remove fish-hooks as well as for use in many other ways.

Playground Activities

A high percentage of playground accidents occur in the use of apparatus. With the exception of apparatus, sports constitute the principal activity of the playground and are the secondary source of accidents. Since the safety controls for the various sports are discussed in preceding chapters, they need not be repeated here.

Apparatus activities may cause as high as 65.5 per cent of playground accidents. The reader is referred to Chapter II where playground accident statistics are covered in detail. The arrangement of play areas, care of equipment, and surfacing of grounds were treated in Chapter VIII and the leadership controls were discussed in Chapter VI. The reader is also referred to Chapter X where leadership and skill controls covering apparatus are discussed. Parents have been led to believe that the playground has been built to provide a safe place for their youngsters to play. The administration, especially the director, should realize that this trust exists and bend every effort to be worthy of it.

Specific Administrative Controls

Regulations governing participants should be established for the use of all apparatus in accordance with their age, sex, and abilities. Usually such designations and restrictions are determined for all playgrounds in the system. If they are not, the playground director should determine those pieces of equipment which should be used by the various groups. For instance, older children should not be allowed to use the swings, teeters, and so on, nor should the very young children or the unskilled be permitted to use the parallel or high bars. Danford says:

> In Madison we restrict the use of the ladders and bars to children above the third grade, as we found that almost all the serious

injuries which occurred on these two pieces of equipment when they were first installed involved primary grade children who lacked the necessary height, weight, strength, and judgment to use them with reasonable safety.[12]

Wide World Photos

FIG. 67. PARENTS BELIEVE THEIR CHILDREN ARE SAFE IN A PLAYGROUND

The playground is as safe or as dangerous as the director and the administration make it. Since parents send their children there for safety's sake, every effort must be made to protect them.

Safety lines or fences should be provided for all dangerous apparatus or play areas. The well-arranged playground has

[12] "Safety in School Athletic Equipment and Recreational Areas," *American School Board Journal*, December, 1946, p. 34.

various separated areas for the different groups. If natural barriers or fences are not provided, it may be possible to rope off or paint lines to designate the areas. Playground leaders (may be safety patrols) should be selected and trained to protect younger or less experienced performers on all apparatus. *Apparatus should not be used except under supervision.* Rings, ropes, and poles should be tied when they are not in use or when no supervision is possible. Children should not be allowed to use wet apparatus. Children should be instructed to report unsafe apparatus, unsafe conditions, and injuries to the instructor. This instruction might well be included among the various posted rules and regulations. It is a necessary precaution because the playground director may miss some weakness in his daily inspection or may not be present when some apparatus gives way.

Children *should not be allowed to run or play with sharp, dangerous objects* in their mouths or hands. Children often play with lollypops in their mouths, and it is a very dangerous practice unless the "sticks" are of the harmless paper type. Similarly, craft tools must not be taken to the play areas nor should children be allowed to use knives, sling shots, BB guns, and so forth on the playgrounds. *Children should be taught how to use the apparatus correctly and safely.* No supervised playground would be worthy of the name if a constant program of safety education were not carried on. It need not be the negative "don't do this" type, but it should be the positive "do it this way" type. Children should be taught to observe the rules of the game as well as the playground safety rules. If apparatus is to be used safely, it must be used properly, and the only method of insuring proper usage is through instruction and careful supervision. The *landing areas around apparatus should be soft;* when feasible, mats should be provided, otherwise there should be sand, shavings, sawdust, or other suitable material. Since most apparatus injuries are the result of falls, this provision is an important one.

Specific Apparatus Precautions

Climbing Ropes and Poles (see page 260).

Giant Strides. Many authorities recommend the elimination of this apparatus, but where it is used the following precautions should be taken: 1. Children should be instructed not to overtake the one ahead. 2. All performers should start and stop at once, and no one should drop out. When leaving the stride, the child should let the others know and run out of the way immediately. 3. Children should never be allowed to put their feet through the rungs.

Horizontal Ladders and Traveling Rings. 1. Children should not be allowed to use this apparatus for other than suspension exercises. 2. Those too small to reach the apparatus should not be lifted by others to use it. 3. Teach proper grip with thumbs around the rings. 4. Do not use ladder when it is wet. 5. All children should start at the same end of the ladder and progress in the same direction. 6. In dismounting, draw up the legs slightly and look down before dropping. Knees should be bent slightly when the feet strike the ground. If the child is dismounting with a swing, he should do so on the backward rather than the forward swing. 6. Do not permit congestion on the ladder; be sure the next rung is free before permitting a child to advance to it. 7. Prohibit all speed contests.

Horizontal and Parallel Bars. (See horizontal ladder suggestions. Several of them apply here.) 1. Only qualified performers should be permitted to use these bars for other than simple pull-ups and hangs. 2. Bars should be adjusted to proper heights for users. 3. Spotters should be provided for all stunts. 4. Only one child at a time should be permitted to use these bars. 5. The bars are for children who can reach them; not for children who have to be lifted up.

Slides. 1. Children should be instructed to use the slide in proper manner and should not be permitted to climb up the sliding surface or its frame supports. 2. They should be instructed to slide down one at a time, feet first, with hands *off* the sides. 3. Holes at foot of slides should be filled in daily.

Swings. 1. Users should sit in swings, never stand or hang by their knees. Two children should not occupy one swing.

2. Pushers should not be allowed to swing others. 3. Children should not be allowed to swing to dangerous heights.

Sand Bins. 1. Throwing of sand should not be permitted. 2. The sand should be sifted often to remove injurious materials.

Teeter Boards. 1. Teeter boards should be used when the child is in a sitting position only, and his feet should be kept from beneath the board. 2. Bumping should be prohibited. 3. One child should leave the board only after informing the other, and then when he is in the middle position only.

Wading Pools. 1. Pools must be kept clear of extraneous materials that may injure a child. 2. Supervision of the pool must be provided at all times. 3. Children must be taught not to throw things while they are playing in the pool.

Jungle Gym. 1. Teach proper grip, with thumbs around the rings. 2. The child should hold on with both hands except while he is moving from one position to another. 3. The jungle gym should not be used when it is wet. 4. Overcrowding should not be permitted. 5. Use of this piece of apparatus should be restricted to children in the kindergarten and primary grades.

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